EPSON EL 3S/33
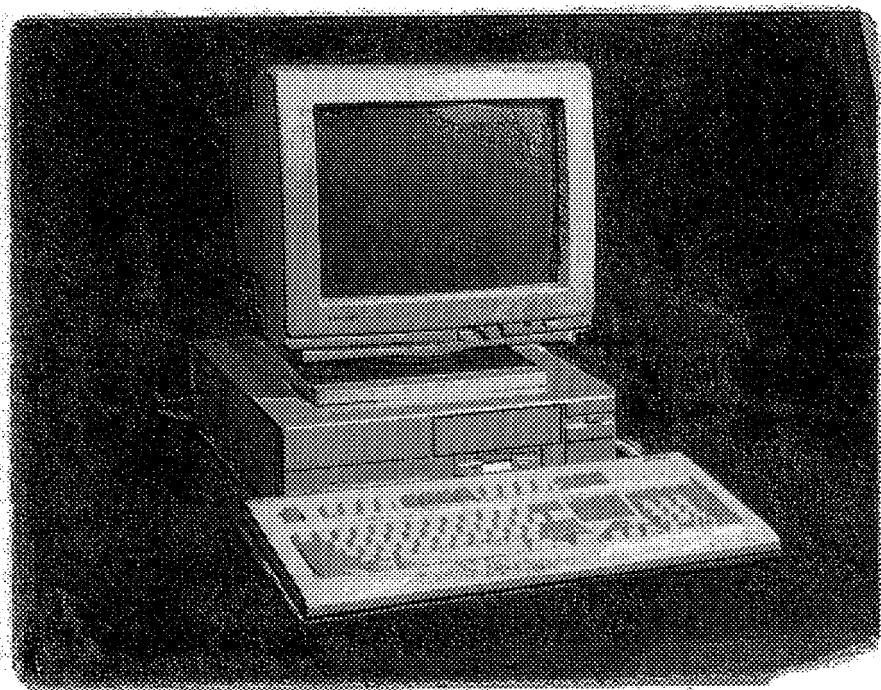

User's Guide

FCC COMPLIANCE STATEMENT
FOR AMERICAN USERS

This equipment has been tested and found to comply with the limits for a class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio and television reception. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio and television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

❑ Reorient or relocate the receiving antenna
❑ Increase the separation between the equipment and receiver
❑ Connect the equipment into an outlet on a circuit different from that to which the receiver is connected
❑ Consult an experienced radio/TV technician for help.

WARNING

The connection of a non-shielded equipment interface cable to this equipment will invalidate the FCC Certification of this device and may cause interference levels that exceed the limits established by the FCC for this equipment. It is the responsibility of the user to obtain and use a shielded equipment interface cable with this device. If this equipment has more than one interface connector, do not leave cables connected to unused interfaces.

Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.

FOR CANADIAN USERS

This digital apparatus does not exceed the Class B limits for radio noise emissions from digital apparatus as set out in the radio interference regulations of the Canadian Department of Communications.

Le present appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de Classe B prescrites dans le règlement sur le brouillage radioélectrique édicté par le Ministère des Communications du Canada.

EPSON® EL 3S/33

User's Guide

This manual is printed on recycled paper and is 100% recyclable.

Important Safety Instructions

1. Read all of these instructions and save them for later reference.

2. Follow all warnings and instructions marked on the computer.

3. Unplug the computer from the wall outlet before cleaning. Use a damp cloth for cleaning; do not use liquid or aerosol cleaners.

4. Do not spill liquid of any kind on the computer.

5. Do not place the computer on an unstable cart, stand, or table.

6. Slots and openings in the cabinet and the back or bottom are provided for ventilation; do not block or cover these openings. Do not place the computer near or over a radiator or heat register.

7. Operate the computer using the type of power source indicated on its label.

8. If you plan to operate the computer in Germany, observe the following safety precaution:

   To provide adequate short-circuit protection and over-current protection for this computer, the building installation must be protected by a 16 Amp circuit breaker.

   Beim Anschluß des Computers an die Netzversorgung muß sichergestellt werden, daß die Gebäudeinstallation mit einem 16 A Überstromschutzschalter abgesichert ist.

9. Connect all equipment to properly grounded (earthed) power outlets. If you are unable to insert the plug into an outlet, contact your electrician to replace your outlet. Avoid using outlets on the same circuit as photocopiers or air control systems that regularly switch on and off.

10 Do not allow the computer's power cord to become damaged or frayed.

11. If you use an extension cord with the computer, make sure the total of the ampere ratings of the devices plugged into the extension cord does not exceed the ampere rating for the extension cord. Also, make sure the total of all products plugged into the wall outlet does not exceed 15 amperes.

12. Do not insert objects of any kind into this product through the cabinet slots.

13. Except as specifically explained in this User's Guide, do not attempt to service the computer yourself. Refer all servicing to qualified service personnel.

14. Unplug the computer from the wall outlet and refer servicing to qualified service personnel under the following conditions:

   A. When the power cord or plug is damaged.

   B. If liquid has entered the computer.

   C. If the computer does not operate normally when the operating instructions are followed. Adjust only those controls that are covered by the operating instructions. Improper adjustment of other controls may result in damage and often requires extensive work by a qualified technician to restore the computer to normal operation.

   D. If the computer has been dropped or the cabinet has been damaged.

   E. If the computer exhibits a distinct change in performance.

Instructions Importantes de **Sécurité**

1. Lire complètement les instructions qui suivent et les conserver pour references futures.

2. Bien suivre tous les avertissements et les instructions indiqués sur l'ordinateur.

3. Debrancher l'ordinateur de toute sortie murale avant le nettoyage. Utiliser un chiffon humide; ne jamais utiliser un nettoyeur liquide ou une bonbonne aerosol.

4. Ne jamais renverser un liquide d'aucune sorte sur l'ordinateur.

5. Ne pas placer l'ordinateur sur un chariot, un support, ou une table instable.

6. Les évents dans les meubles, à l'arrière et en dessous sont conçus pour l'aération; on ne doit jamais les bloquer. Ne pas placer l'ordinateur près d'une source de chaleur directe.

7. Le fonctionnement de l'ordinateur doit s'effectuer conformément au type de source d'alimentation indiquée sur l'étiquette.

8. Lorsqu'on desire utiliser l'ordinateur en Allemagne, on doit observer les normes sécuritaires qui suivent:

    Afin d'assurer une protection adéquate à l'ordinateur contre les court-circuits et le survoltage, l'installation de l'édifice doit comprendre un disjoncteur de 16 amp.

9. On doit brancher tout l'équipement dans une sortie reliée à la masse. Lorsqu'il est impossible d'insérer la fiche dans la prise, on doit retenir les services d'un électricien ou remplacer la prise. Ne jamais utiliser une prise sur le même circuit qu'un appareil à photocopie ou un système de contrôle d'aération avec commutation marche-arrêt.

10. S'assurer que le cordon d'alimentation de l'ordinateur n'est pas effrité.

11. Dans le cas où on utilise un cordon de rallonge avec l'ordinateur, on doit s'assurer que la valeur totale d'ampères branchés dans le cordon n'excède en aucun temps les ampères du cordon de rallonge. La quantité totale des appareils branchés dans la prise murale ne doit jamais excéder 15 amperes.

12. Ne jamais insérer un objet de quelque sorte que ce soit dans les cavités de cet appareil.

13. Sauf tel que spécifié dans la notice d'utilisation, on ne doit jamais tenter d'effectuer une réparation de l'ordinateur. On doit référer le service de cet appareil à un technicien qualifié.

14. Debrancher l'ordinateur de la prise murale et confier le service au personnel de service qualifié selon les conditions qui suivent:

    A. Lorsque le cordon d'alimentation ou la prise sont endommagés.

    B. Lorsqu'un liquide s'est infiltré dans l'ordinateur.

    C. Lorsque l'ordinateur refuse de fonctionner normalement même en suivant les instructions. N'ajuster que les commandes qui sont énumérées dans les instructions de fonctionnement. Tout ajustement inadéquat de tout autre contrôle peut provoquer un dommage et souvent nécessiter des réparations élaborées par un technicien qualifié afin de remettre l'appareil en service.

    D. Lorsqu'on a échappé l'ordinateur ou que l'on a endommagé le boîtier.

    E. Lorsque l'ordinateur démontre un changement noté au niveau de sa performance.

Contents

Chapter *2* *Using Your Computer*

Chapter *3* *Installing and Removing Options*

Chapter *4* *Installing* **and** *Removing Drives*

Chapter 5 Installing Video Drivers

*Chapter **6 Troubleshooting***

*Appendix A **Specifications***

Index

Introduction

Your new Epson® EL 3S/33 computer is a high-performance system offering flexibility and expandability in a compact design. It provides the following features:

❏ 386SX, 33 MHz microprocessor

❏ 2MB or 4MB of internal memory, expandable to 16MB

❏ System and video BIOS shadow RAM

❏ 256KB of on-board video memory, expandable to 512KB or 1024KB

❏ Built-in VGA port

❏ Two built-in serial ports, one built-in parallel port, and one built-in game port

❏ Built-in PS/2 compatible keyboard port

❏ Three 16-bit full-length and two 8-bit half-length ISA option slots

❏ Support for up to three mass storage devices.

The shadow RAM feature allows your system to speed up processing by moving the system and video BIOS into the RAM area of memory.

Using the built-in interfaces, you can connect most of your peripheral devices directly to the computer so you do not have to install option cards. You can use the option slots to enhance your system with extra functions such as a modem card, a network controller card, or additional interface ports.

The VGA controller supports standard resolutions up to
640 x 480 in 16 colors and extended resolutions up to 1024 x 768
in 4 colors (interlaced or non-interlaced). With 512KB video
memory, the controller supports resolutions up to 1024 x 768 in
16 colors; with 1024KB, it supports the same resolutions in up
to 256 colors.

VGA Utilities

Your computer comes with special VGA drivers and utilities
for use with the integrated VGA interface. With these utilities,
you can take advantage of the extended VGA features such as
high resolutions and 132-column text mode when you run
popular application programs.

Optional Equipment

You can easily upgrade your computer by installing additional
memory and a wide variety of options as described in
Chapters 3 and 4.

Memory

By adding 256KB, 1MB, and 4MB SIMMs (single inline memory
modules) to the main system board, you can expand the
computer's memory up to 16MB.

Drives

Your system can support up to three internal mass storage
devices, including hard disk drives, diskette drives, a tape
drive, or a CD-ROM drive. As your storage needs expand, you
can install additional drives.

Math Coprocessor

You may want to install an 80387SX, 33 MHz coprocessor. This
optional math coprocessor allows your computer to perform
mathematical functions faster.

How to Use This Manual

This manual contains the information you need to get the best
results from your computer. You do not have to read
everything in this book; check the following summary.

Chapter 1 provides simple instructions for setting up your
system and connecting peripheral devices such as the monitor
and printer. It also describes running the SETUP program to
define your computer's configuration.

Chapter 2 covers general operating procedures, such as turning
the computer on and off, resetting the computer, and changing
the processor speed.

Chapter 3 describes how to remove and replace the computer's
cover, change jumper settings, and install optional equipment
such as option cards and memory modules.

Chapter 4 explains how to install and remove disk drives.

Chapter 5 describes how to install VGA drivers and utilities.

Chapter 6 contains troubleshooting tips.

Appendix A lists the specifications of your computer, the
software that has been tested on your system, and options
available for your system.

At the end of this manual you'll find an **Index.**

Chapter 1

Setting Up Your System

This chapter briefly describes the operations you will use to set up your computer. It includes the following information:

❏ Getting started

❏ Connecting the computer

❏ Running the SETUP program

❏ Post-SETUP procedures.

Getting Started

Follow the instructions below for choosing a location for your new system, unpacking your system, and setting up your computer.

Choosing a Location

When you select a place to set up your system, choose a safe, convenient location that provides the following:

❏ A flat, hard surface. Surfaces like beds and carpets attract static electricity, which can erase data on your disks, damage the computer's circuitry, and prevent proper ventilation.

❏ Good air circulation. Leave several inches of space around the computer so air can move freely.

❏ Moderate environmental conditions. Select a cool, dry area and protect your computer from extremes in temperature, humidity, dust, and smoke. Avoid direct sunlight or other sources of heat.

❏ No electromagnetic interference. Do not place your system too close to any electrical device, such as a telephone or television, which generates an electromagnetic field.

❏ Appropriate power source. Connect all your equipment with the appropriate power cords for the power source in your area.

Unpacking Your Computer

When you unpack your system components, make sure you have these items:
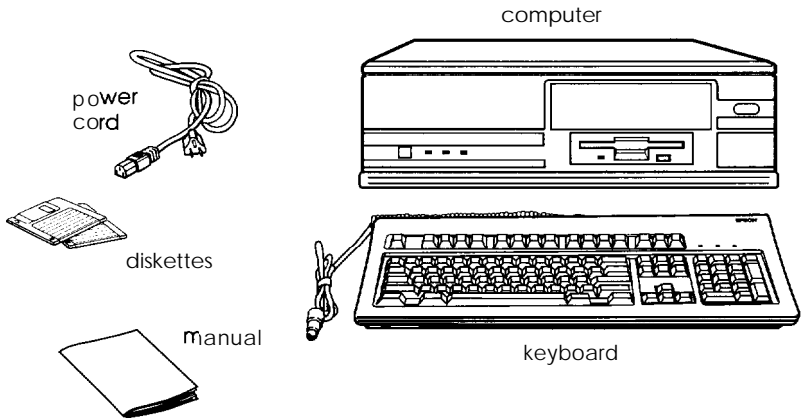
Your system also includes a serial mouse and may come with the operating system and software already installed on a hard disk drive.

If you purchased any optional equipment that goes inside the computer-such as option cards, memory modules, a hard disk, or a diskette drive-you should install these devices before you connect your computer. See Chapters 3 and 4 for instructions.

Connecting the Computer

Use the illustration below to locate the ports on the back of your system as you connect the keyboard, monitor, printer, and other devices.
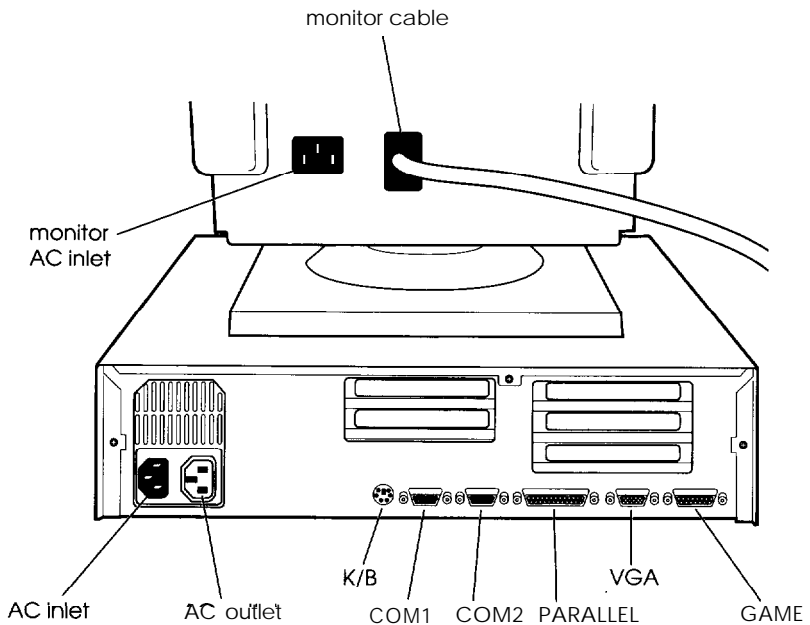
Connecting a Keyboard

To connect a keyboard, hold the cable connector so the arrow on the connector faces up. Insert it into the port marked K/B.

Connecting a Mouse

Your system came with a serial mouse that connects to either of the computer's built-in serial ports. To connect the mouse, insert the connector into one of the ports marked COM1 and COM2.

When you install the drivers for your mouse, make sure you identify the port to which you connected it. See the README file on the diskette that came with your mouse for more information.

Connecting a Monitor

The way you connect your monitor to the computer depends on the type of monitor you have. If you have a VGA monitor (or a multifrequency monitor with an analog connector), you can connect it to the computer's built-in VGA port as described below. If you are connecting your monitor to an adapter card, see Chapter 3.

1. Place your monitor on top of or near the computer. Turn the monitor and computer around so the backs are facing you.

2. There should be two cables provided with your monitor: the monitor cable (to connect it to the computer) and the power cable (to connect it to the power source). On most monitors, the monitor cable is permanently attached to the monitor. If your monitor does not have an attached cable, connect the cable to it now.

3. Examine the connector on the monitor cable and line it up with the VGA port on the computer. Then insert the connector into the port.

> **Caution**
> To avoid damaging the connector, be careful not to bend
> the pins when you insert it.

4. If the connector has retaining screws, tighten them.

5. Plug the monitor power cord into the monitor's power inlet.

6. Plug the other end of the power cord into an appropriate
   grounded electrical outlet or into the power outlet on the
   back of the CPU.

> **Caution**
> If you plug the monitor's power cord into the back of your
> computer, make sure the monitor's power requirements do
> not exceed 1 Amp.

Connecting a Printer of Other Device

Your computer has one parallel and two serial ports. To
connect a printer or other peripheral device, follow the
appropriate instructions below.

Using the Parallel Port

Follow these steps to connect a parallel printer to your
computer:

1. Place the printer next to the computer so that the backs are
   facing you.

2. Align the connector end of the printer cable with the
   PARALLEL port and plug it in. If the connector has retaining
   screws, tighten them.

3.   Connect the other end of the cable to the printer. To secure
     the cable, squeeze the clips at each side of the printer port
     and push them into place.

4.   Plug the printer's power cord into an appropriate grounded
     electrical outlet.

Using the Serial Ports

If you have a printer, a modem, or a mouse with a serial
interface, you can connect it to one of the serial (RS-232C) ports
on the back of the computer. Make sure you have a cable
compatible with a DB-9P connector.

To connect a serial device, insert the connector into one of the
ports marked COM1 and COM2. If you are connecting only one
serial device, use the COM1 port.

Connecting the Power Cord

Follow these steps to connect the power cord:

1.   Plug the power cord into the AC power inlet on the back
     panel.

> Warning
> To avoid an electric shock, be sure to plug the cord into
> the computer before plugging it into the wall outlet.

2.   Plug the other end of the power cord into an appropriate
     grounded electrical outlet.

Turning On the Computer

After you set up your system, you are ready to turn on the power. Follow these steps:

1. Turn your computer around so the front panel faces you. Place your monitor, printer, and other devices in a convenient arrangement.

2. If there is a protective card in the diskette drive, remove it now.

3. Turn on the monitor, printer, and any other devices connected to the computer.

4. Turn on the computer by pressing the power button on the right side of the front panel.

    The screen displays a count of the system memory, and then the computer performs its power-on diagnostics, which are a series of checks that make sure everything is working correctly.

5. If necessary, use the controls on your monitor to adjust the brightness and contrast until you can easily see the characters on the screen.

    If your system is configured to automatically load a program (such as Microsoft Windows or a word processing program), you see the first menu or screen display of that program. If not, you may see the operating system prompt, such as C:\> or A:\>.

    If there is no operating system installed on your computer, you see an error message. Ignore the message for now; once you install the operating system, you will not see this message.

Now follow the instructions in the next section to configure your system using the SETUP program.

Running the SETUP Program

You need to run SETUP the first time you use your computer. Even if your system was configured for you, you may still need to set the date and time, and if your system came unconfigured, you need to define how it is set up. (You also may need to run SETUP again later if you change your configuration.)

SETUP is stored in the computer's ROM BIOS, so you can run it any time. SETUP lets you verify or change the following:

❏ Current date and time

❏ Type of diskette drive(s) and hard disk drive(s)

❏ System memory

❏ Type of video display adapter

❏ Keyboard options

❏ Processor speed

❏ Shadow options

❏ Processor chip features.

The configuration information is stored in an area of memory called CMOS RAM. This memory is backed up by a battery, so it is not erased when you turn off or reset the computer.

Starting the SETUP Program

You can run SETUP whenever you see the operating system command prompt, such as:

    C:\> or A:\>

To start SETUP, hold down Ctrl and Alt, then press S.

Also, whenever you start your computer, if the system detects an error in your system configuration, you will see the following message:

Press the **F1** key to continue, **F2** to run the setup utility

Press **F2** to run the SETUP program to correct your configuration.

The table below lists the keys you can use to perform SETUP operations.

SETUP function keys

Key	Function
↑ ↓ ← →	Moves the cursor to the next or previous modifiable option
+ −	Changes the values in the field
PgDn PgUp	Displays the next or the previous menu
F1	Displays a help screen describing the option currently selected
F4	From the exit menu, **saves** the changes you have made and restarts your computer
F5	From the exit menu, supplies the factory default values for all SETUP options
F6	From the exit menu, leaves the SETUP program without saving any changes
Esc	Displays the exit menu

Whenever you are in the SETUP program, the bottom of the screen lists the keys you can press to perform specific functions.

Displaying System Information

The SETUP program provides a system information screen which lists the following:

❏ Processor type

❏ Coprocessor type (if one is installed)

❏ Reserved memory

❏ BIOS version number

❏ Addresses for video mode, serial ports, and printer ports.

To see this information, press F2 from either of the SETUP screens.

Setting the Date and Time

The real-time clock in your computer continuously tracks the date and time-even when the computer is turned off. Once you set the date and time using SETUP, you should not need to change them, unless you adjust the time for daylight savings or other seasonal adjustments. (The computer automatically changes the date for leap years.)

Use ↑, ↓, ← or → to move the cursor to the value you want to change. Then press + or - until you see the value you want.

Setting the Diskette Drive(s)

On your system, diskette drive A is the 3.5-inch high-density drive installed in the lower drive bay on your system. You may also have another drive of a different size or capacity; this is drive B. Check the settings for both drives and correct them if necessary.

Note
If you add a diskette drive and want to reassign the top drive as drive A, you must change jumpers J17 through J20, as described in Chapter 3. Then run SETUP to reassign drive types.

Setting the Hard Disk Drive(s)

The SETUP program lets you select the type of hard disk drive(s) installed in your computer. If your system was configured for you, the hard disk drive type has been preset. To set the hard disk drive type, follow these guidelines:

❏   If your system does not have a hard disk, select
    Not Installed for Hard Disk 1 and **Hard Disk 2.**

❏   If your computer came with an Epson-installed hard disk drive, you need to define your own drive type. For more information, see "Defining your own drive type" on page 1-14.

❏   If you have installed another type of hard disk drive, you need to select the **drive** type number that matches your drive.

Hard disk drive types

The table below lists standard hard disk drives. Check this table and your drive documentation to find the correct type number. If none of the types listed matches your drive, see page 1-14.

Hard disk drive types

Type	Cyl	Hd	Pre	LZ	Sec	Size*(MB)
1	306	4	128	305	17	10
2	615	4	300	615	17	20
3	615	6	300	615	17	30
4	940	8	512	940	17	62
5	940	6	512	940	17	46
6	615	4	-1	615	17	20
7	462	8	256	511	17	30
8	733	5	-1	733	17	30
9	900	15	-1	901	17	112
10	820	3	-1	820	17	20
11	855	5	-1	855	17	35
12	855	7	-1	855	17	49
13	306	8	128	319	17	20
14	733	7	-1	733	17	42
16	612	4	0	663	17	20
17	977	5	300	977	17	40
18	977	7	-1	977	17	56
19	1024	7	512	1023	17	59
20	733	5	300	732	17	30
21	733	7	300	732	17	42
22	733	5	300	733	17	30
23	306	4	0	336	17	10

Hard disk drive types (continued)

Type	Cyl	Hd	Pre	LZ	Sec	Size* (MB)
24	Drive table entry unused					
25	615	4	0	615	17	20
26	1024	4	-1	1023	17	34
27	1024	5	-1	1023	17	42
28	1024	8	-1	1023	17	68
29	512	8	256	512	17	34
30	615	2	615	615	17	10
31	989	5	0	989	17	41
32	1020	15	-1	1024	17	127
33	615	4	-1	615	26	31
34	820	6	-1	820	26	62
35	1024	9	1024	1024	17	76
36	1024	5	512	1024	17	42
37	1024	5	512	1024	26	65
38	823	10	256	824	17	68
39	615	4	128	664	17	20
40	615	8	128	664	17	40
41	917	15	-1	918	17	114
42	1023	15	-1	1024	17	127
43	823	10	512	823	17	68
44	820	6	-1	820	17	40
45	1024	5	-1	1023	17	42
46	925	9	-1	925	17	69
47	699	7	256	700	17	40
48, 49	User-defined drive type					

*   Actual formatted size may be slightly different than size on drive label.

Defining your own drive type

If the parameters for your hard disk (listed in its documentation) do not match any of the types listed in the table above, you can define your own type. Follow these steps:

1. Move your cursor to **Hard Disk 1 or 2** and press + or - until you see drive type 48 or type 49.

2. Press + to move the cursor to the **Cyl** field.

3. Type the appropriate cylinder value for your hard disk. The documentation that came with your hard disk drive will provide the appropriate information.

4. Continue pressing → to move the cursor to the next field and type in the appropriate values.

If you are installing Epson-supplied drives, use the information in the following table to define your drive type.

Epson-supplied hard disk drive types

Epson drive options	Cyl	Hd	Pre	LZ	Sec	Size* (MB)
80MB (Conner)	903	4	0	903	46	81
120MB (Conner)	762	8	0	761	39	115
170MB (Conner)	903	8	0	903	46	162
170MB (Quantum)	1101	15	−1	1101	22	170
240MB (Quantum)	723	13	−1	722	51	234

. Actual formatted size may be slightly different than size on drive label.

Note
If you are going to install NetWare 286, version 2.2, you cannot assign a user-defined drive type for your drive without installing two IDE drivers. You can obtain these drivers (IDE.DSK and IDE.OBJ) by downloading IDE286.ZIP from CompuServe®Alternatively, you can select one of the pre-defined hard disk drive types that most closely matches the drive you are installing.

Checking System Memory

Your computer comes with 2MB or 4MB of random access
memory (RAM) on SIMMs. DOS and application programs that
run under DOS use the first 640KB of memory. You can use the
memory above 1MB as extended memory.

When you boot your system, the system BIOS detects the type
of RAM and updates the base memory size and the extended
memory size automatically. You see the memory configuration
displayed on this SETUP screen.

Setting the Video Display Type

The Video Card option lets you define the type of adapter
you are using for your primary display. If you connected your
monitor to the computer's built-in VGA port, select EGA/VGA.
If you installed an optional video card, follow the guidelines
below to select the correct adapter type.

Video display type options

Select	If
EGA/VGA	You connected your monitor to the built-in VGA port or you installed a VGA or enhanced graphics adapter (EGA) card
CGA40*	You installed an optional color graphics adapter set to 40-column color graphics adapter (CGA) mode
CGA80*	You installed a CGA or a multi-mode graphics adapter (MGA) attached to a color monitor
MONO*	You installed a monochrome display adapter or an MGA attached to a monochrome monitor

*   For these options, you must change jumpers J36 and J37 on the system
board to the OFF position.

> **Note**
> If you are installing a monochrome monitor, you also need
> to set jumper J11 on the main system board to position 2-3.
> See Chapter 3 for more information on setting jumpers.

Setting Keyboard Options

Two options in the SETUP program allow you to control
keyboard settings. The **Keyboard** option allows you to disable
the built-in keyboard connector if you are using an optional
connector.

The **NumLock on** at boot option determines the initial state
of the num lock function when you turn on or reset your
system. When num lock is off, the keypad controls cursor
movement. If num lock is on, the keypad types numbers.

Select **YES** to set the num lock function on when the system
starts.

Setting the Processor Speed

The **CPU Speed** option sets the processor speed to fast or
slow. At fast speed, your processor operates at its fastest speed,
33 MHz. At the slow speed setting, the processor operates at
8 MHz to provide compatibility with older application
programs.

> **Note**
> The Cyrix cache option is not available on this system.

Setting Chip Set Feature Control Options

The second screen of the SETUP program contains the options related to the features on your system board. Press PgUp or PgDn to display this screen.

Relocating memory

The Relocate Memory option relocates the memory between A0000h to BFFFFh and D0000h to EFFFFh for use as extended memory. If you enable shadowing, however, relocation is automatically disabled.

Shadow RAM options

Your computer can access RAM (random access memory) faster than ROM (read only memory).

Two shadow features (Shadow **BIOS ROM** and Shadow Video ROM) allow your system to copy the contents of its system and/or video ROM into RAM so it can perform certain operations faster.

You can also shadow 32KB or 64KB of memory that starts at the indicated addresses to RAM. If you enable these options, you cannot use the Relocate Memory feature.

Additional options

Two additional chipset feature options allow you to slow down your system in case you need compatibility with slower option cards or diskette drives.

If you enable the **ISA 1** wait state option, the system inserts one wait state in a 16-bit ISA cycle rather than providing the fastest processing at zero wait states.

The Slow Refresh option, when enabled, improves system performance because it shortens the time needed for each refresh cycle.

Exiting the SETUP Program

When you leave the SETUP program, you can save your settings and reboot your system, or exit SETUP without saving your settings. You can also return all values to the factory defaults.

To leave the SETUP program, press Esc from any SETUP screen. From the SETUP exit menu, press these keys to perform the following functions:

Esc   Returns to the SETUP utility

F4   Saves the changes you have made to your configuration and restarts your computer

F5   Supplies the factory default values for all SETUP options

F6   Exits the SETUP utility and returns to the system prompt without saving any changes.

Post-SETUP Procedures

After you run SETUP for the first time, you may need to install the operating system on your computer. See your operating system manual for instructions.

Also, install any software you plan to use. See your application program manuals for instructions.

You may also want to install the optional extended video drivers for some of your application programs. See Chapter 5 for more information.

Chapter 2

Using Your Computer

This chapter briefly describes the following operations:

❏ Turning the computer on and off

❏ Inserting and removing diskettes

❏ Stopping a command or program

❏ Resetting the computer

❏ Changing the processor speed.

Turning On the Computer

Before you turn on your computer, check the following safety rules to avoid accidentally damaging your computer or injuring yourself:

❏ Do not connect or disconnect any peripheral device cables (including the keyboard or a mouse) or power cables when the computer's power is on.

❏ Never turn off or reset your computer while a disk drive light is on. This can destroy data stored on the disk.

❏ Always wait at least 20 seconds after you turn off the power before you turn it on again. This prevents possible damage to the computer's electrical circuitry.

❏ Do not leave a beverage near your system. Spilled liquid can damage the circuitry of your equipment.

Follow these steps to turn on your system:

1. Turn on the monitor, printer, and any other peripheral devices connected to the computer.

2. If you do not have a hard disk with an operating system loaded on it, insert your main operating system diskette in drive A.

3. To turn on the computer, press the power button located on the right side of the front panel, as shown below.
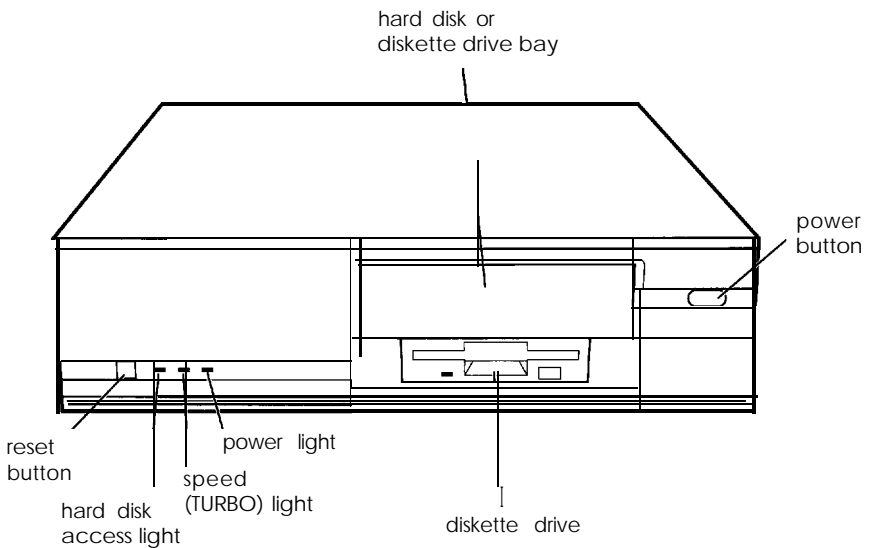
The power indicator lights up. After a few seconds, the computer displays a count of its system memory, and then performs its power-on diagnostics. This is a series of checks the computer runs each time you turn it on to make sure everything is working correctly.

When the system has successfully completed its diagnostics, DOS prompts you to verify the correct date and time. If they are correct, press Enter. Otherwise, enter the current date and time. If your system is configured to automatically start Microsoft Windows or has a different operating system, you may not see this prompt.

What happens next depends on how your computer is set up. If your system is configured to automatically load a program (such as Microsoft Windows or a word processing program), you see the first menu or screen display of that program. If not, you may see the operating system prompt, such as `c : \ >` or `A: \>.`

Turning Off the Computer

Whenever you turn off your system, follow these steps:

1. Save your data and exit any application program you are using.

2. Check the hard disk drive light and the diskette drive light(s) to make sure they are not on. Do not turn off the computer if a drive light is on, because you can damage the drive or lose data.

3. Remove any diskette(s) from the diskette drive(s).

4. Press the power button to turn off the computer and then turn off the monitor, printer, and any other peripheral devices.

Inserting and Removing Disks

To insert a diskette into a 3.5-inch drive, hold the diskette with
the label facing up and the metal shutter leading into the drive,
as shown in the following illustration. Slide the diskette into the
drive until it clicks into place.
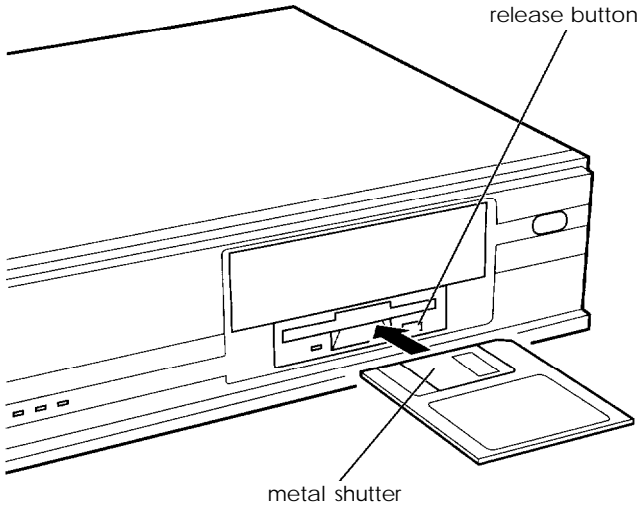
To insert a diskette into a 5.25-inch drive, hold the diskette with
the label facing up and the read/write slot leading into the
drive.

When you want to remove the diskette, make sure the drive
light is off; then press the release button or turn the latch.
Remove the diskette and store it properly.

Caution
Never remove a diskette or reset or turn off the computer
while a diskette drive light is on. You could lose data. Also,
remove all diskettes before you turn off the computer.

Stopping a Command or Program

You may sometimes need to stop a command or program while it is running. If you have entered a DOS or application program command that you want to stop, try one of the following:

❑ Press Pause

❑ Hold down Ctrl and press C

❑ Hold down Ctrl and press Break.

If these methods do not work, you may need to reset the computer as described below. Do not turn off the computer to exit a program or stop a command unless you have to, because the computer erases any data you did not save.

Resetting the Computer

Occasionally, you may want to clear the computer's current settings or its memory without turning it off. You can do this by resetting the computer.

For example, if an error occurs and the computer does not respond to your keyboard entries, you can reset it to reload your operating system and try again. However, resetting erases any data in memory that you have not saved; so reset only if necessary.

Caution
Do not reset the computer to exit a program. Some programs classify and store new data when you exit them in the normal manner. If you reset the computer without properly exiting a program, you may lose data.

To reset the computer, the operating system must be either on the hard disk or on a diskette in drive A; so if you do not have a hard disk, insert the system diskette in drive A. Press the RESET button located on the front left side of your computer. If you are using DOS, you can also hold down Ctrl and Alt and press Del. The screen displays nothing for a moment and then the computer should reload your operating system.

If resetting the computer does not correct the problem, you probably need to turn it off and on again. Remove any diskette(s) from the diskette drive(s). Turn off the computer and wait 20 seconds. If you do not have a hard disk, insert the system diskette in drive A. Then turn on the computer.

Changing the Processor Speed

Your computer's processor can operate at two speeds: high speed (33 MHz) or low speed (8 MHz). The low speed is available to provide compatibility with older application programs.

When your computer is operating at high speed, the TURBO light on the front panel is on. When the computer is operating at low speed, the light is off.

You should use high speed for almost everything you do because your programs will work faster. However, certain application programs have specific timing requirements and can run only at the slower speed. See your software manual to determine if this is the case.

Some copy-protected programs require the computer to run at low speed while accessing the program on a diskette. These programs also usually require you to leave a *key* disk-the diskette that contains the copy protection-in the diskette drive. If you use a copy-protected program, you can change the speed to low to access the diskette and return it to high speed when you are finished.

You can change the processor speed temporarily by entering one of the following commands from the numeric keypad on your keyboard:

❏ To select low speed, press Ctrl Alt -. (Hold down the Ctrl key and the Alt key simultaneously and then press the - key on the numeric keypad.) The speed light turns off.

❏ To select high speed, hold down the Ctrl and Alt keys and press + on the numeric keypad. The speed light comes on.

Note
You can use the commands listed above while you are running a program. However, if the program uses one of these commands for another function, you cannot use it to change the processor speed. You can, however, change the processor speed through the SETUP program.

The speed setting remains in effect until you do the following:

❏ Reset your computer

❏ Turn off your computer

❏ Change the speed with another keyboard command

❏ Change the speed setting in the SETUP program.

Chapter 3

Installing and Removing Options

You can enhance the performance of your computer by adding optional equipment such as memory modules, option cards, or a math coprocessor.

Memory modules-also called SIMMs (single inline memory modules)-allow you to increase the amount of memory in your computer.

An option card is a circuit board you install in your computer to add a particular function, such as a modem or an additional interface port.

The math coprocessor can be installed on the system board to enhance numeric-intensive operations for software that supports the coprocessor.

This chapter first describes how to remove your computer's cover to install options and how to replace the cover when you are finished. It then describes the following:

❏ Locating the internal components

❏ Changing the jumper settings

❏ Installing and removing memory modules (SIMMs)

❏ Installing and removing option cards

❏ Adding video memory

❏ Installing the math coprocessor.

> **Caution**
> Never install options or change jumper settings with the
> computer turned on or the power cord connected to the
> computer.

Once you have installed your option, see "Post-installation
Procedures" on page 3-20.

Removing and Replacing the Cover

You need to remove the computer's cover to install any of the
options described in this chapter or to install or remove a disk
drive (as described in Chapter 4).

Follow these steps to remove the cover:

1. Turn off the computer and then any peripheral devices
   (including the monitor and printer).

2. Disconnect the computer's power cable from the electrical
   outlet and from the back panel. Also disconnect any cables
   that are connected to the computer, including the keyboard
   cable.

3. If the monitor is on top of the computer, lift it off and set it
   to one side.

4. Turn the computer around so the back panel is facing you.

5. Remove the three screws securing the back panel, as shown below.
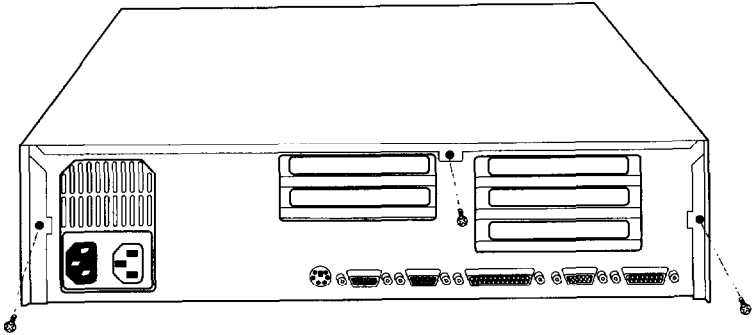
6. Grasp the sides of the cover and lift it straight up, as shown below:
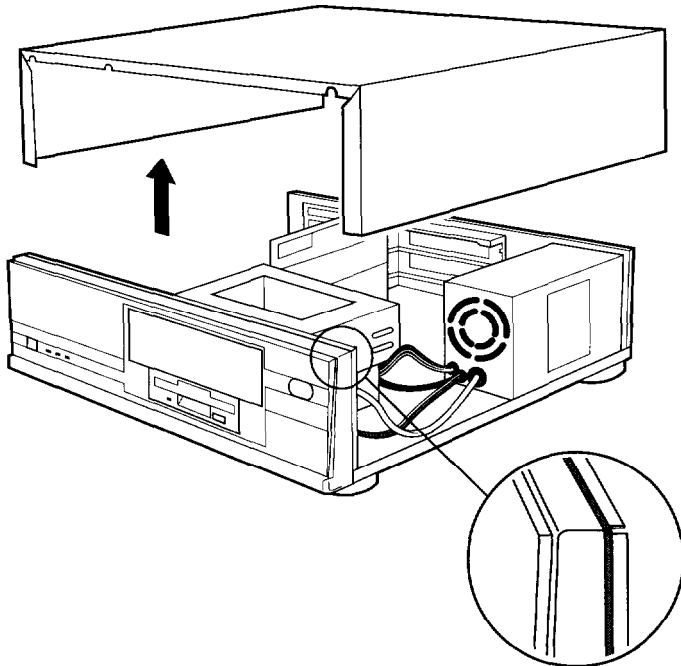
7. Set the cover aside.

8. Ground yourself to the computer by touching the metal surface of the back panel.

Warning
Be sure to ground yourself by touching the back panel of the computer every time you remove the cover. If you are not properly grounded, you could generate an electric shock that could damage a component when you touch it.

When you are ready to replace the computer's cover, follow these steps:

1. Make sure all the internal components are installed properly.

2. Check all cable connections, especially those that might have been loosened during your work.

3. Make sure all cables are out of the way so they do not catch on the cover.

4. Insert the front of the cover between the front bezel and the chassis of the computer and guide it straight down.

5. Replace the three cover retaining screws.

6. Reconnect the computer to the monitor, printer, keyboard, and any other peripheral devices you have. Then reconnect the power cable to the back of the computer and to an electrical outlet.

Locating the Internal Components

As you follow the instructions in this chapter, refer to the following illustration to locate the different components inside your computer.
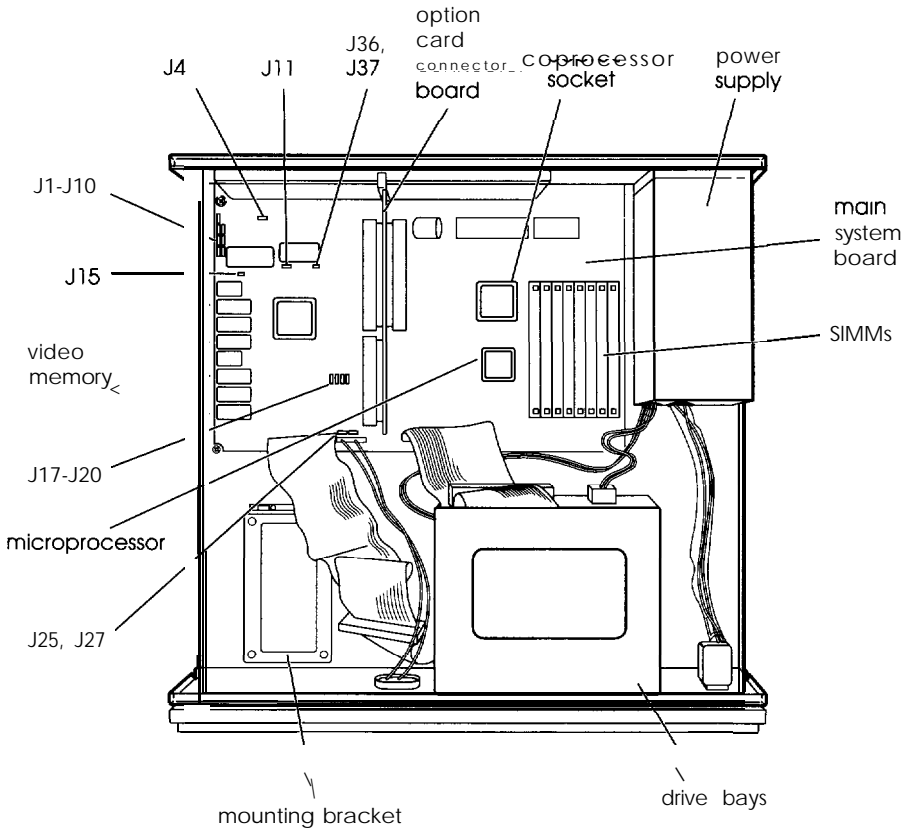
Changing the Jumper Settings

The main system board in your computer has a number of
jumpers which control certain functions. These jumpers are
preset at the factory to default positions; however, you can use
the information in the following tables to change their function,
if necessary:

Port jumper settings

Jumper number	Jumper setting	Function
J8	1-2* 2-3	Enables COM1 serial port Disables COM1 serial port
J10	1-2* 2-3	Assigns COM1 serial port as COM1 Assigns COM1 serial port as COM3**
J2	1-2* 2-3	Enables COM2 serial port Disables COM2 serial port
J3	1-2* 2-3	Assigns COM2 serial port as COM2 Assigns COM2 serial port as COM4**
J7	1-2* 2-3	Enables parallel port Disables parallel port
J9	1-2* 2-3	Assigns parallel port as LPT1 Assigns parallel port as LPT2**
J4	1-2* 2-3	Enables game port Disables game port

* Factory setting

.* DOS automatically reassigns parallel and serial ports. Check your DOS
   manual for more information.

Drive assignment jumper *settings*

Drive assignment	J17	J18	J19	J20
Upper drive is A	2-3	2-3	2-3	2-3
Lower drive is A	1-2*	1-2*	1-2*	1-2*

* Factory setting

Diskette drive con troller jumper settings

Jumper number	Jumper setting	Function
J27	1-2* 2-3	Enables diskette drive controller Disables diskette drive controller

* Factory setting

Hard disk drive con troller jumper settings

Hard disk controller	J25	J22**
Enable	1-2*	On*
Disable	2-3	Off

* Factory setting
** Two-pin jumper

Display adapter jumper settings

Jumper number	Jumper setting	Function
J11	1-2' 2-3	Color VGA display adapter Monochrome display adapter
J15**	On Off	Interlaced mode Non-interlaced mode

* Factory setting
** Two-pin jumper

Built-in VGA jumper settings

Built-in VGA	J36**	J37**
Enable	On*	On*
Disable	Off	Off

* Factory setting
** Two-pin jumper

Note
To use an external display adapter in an expansion slot, you must disable the built-in VGA adapter.

Setting the Jumpers

If you need to change any jumper settings, follow these steps:

1. Refer to the illustration on page 3-5 to locate the jumpers.

2. If there are any option cards installed in your computer, you need to remove them to access the jumpers. See page 3-16.

3. A jumper's setting is determined by where the jumper is placed on the pins. A two-pin jumper either connects both pins (on) or sits on just one of the pins (off). For three-pin jumpers, the jumper connects pin 1 and the middle pin (position 1-2) or pin 3 and the middle pin (position 2-3), as shown below.
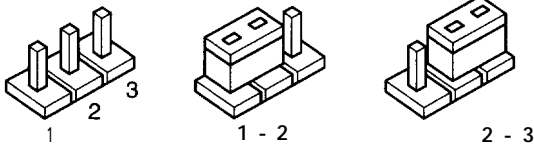
To move a jumper from one position to the other, use needle-nose pliers or tweezers to pull it off its pins and gently move it to the desired position.

Caution
Be careful not to bend the jumper pins or damage any surrounding components on the main system board.

---

4. Replace any option cards you removed. See page 3-13 for instructions.

Installing Memory Modules (SIMMs)

Your computer comes with 2MB or 4MB on SIMMs. By installing additional memory modules, you can increase the amount of memory in your computer up to 16MB.

There are eight SIMM sockets on the main system board, and each can contain one memory module. You can install 256KB, 1MB, and 4MB SIMMs.

The following table shows the possible SIMM configurations; do not install memory in any other configuration. The label on the system board for each SIMM socket (RAM1 through RAM8) identifies the bank of sockets where you should install SIMMs.

SIMM configurations

Bank 0 (RAM5 and RAM6)	Bank 1 (RAM7 and RAM8)	Bank 2 (RAM1 and RAM2)	Bank 3 (RAM3 and RAM4)	Total memory
256KB	256KB	256KB	256KB	2MB
1MB				2MB
256KB	1MB	256KB		3MB
1MB	1MB			4MB
256KB	1MB	256KB	1MB	5MB
1MB	1MB	1MB		6MB
1MB	1MB	1MB	1MB	8MB
4MB				8MB
1MB	4MB	1MB		12MB
4MB	4MB			16MB

Before you install SIMMs, check the following guidelines to ensure that they will work properly:

❏ Use only 30-pin, fast-page mode SIMMs that operate at an access speed of 70ns (nanoseconds) or faster. Be sure all the SIMMs operate at the same speed.

❏ Use the correct SIMM configuration to add the amount of memory you want. See the table above.

Inserting SIMMs

Follow these steps to install SIMMs:

1. Refer to the illustration on page 3-5 to locate the SIMM sockets near the front of the computer.

2. Remove any option cards that may be blocking your access to the SIMM sockets. (See page 3-16 for instructions.)

3. Position the first SIMM at an angle over the first empty socket in the bank you are filling, as shown below. The components on the SIMM should face the inside of the computer.
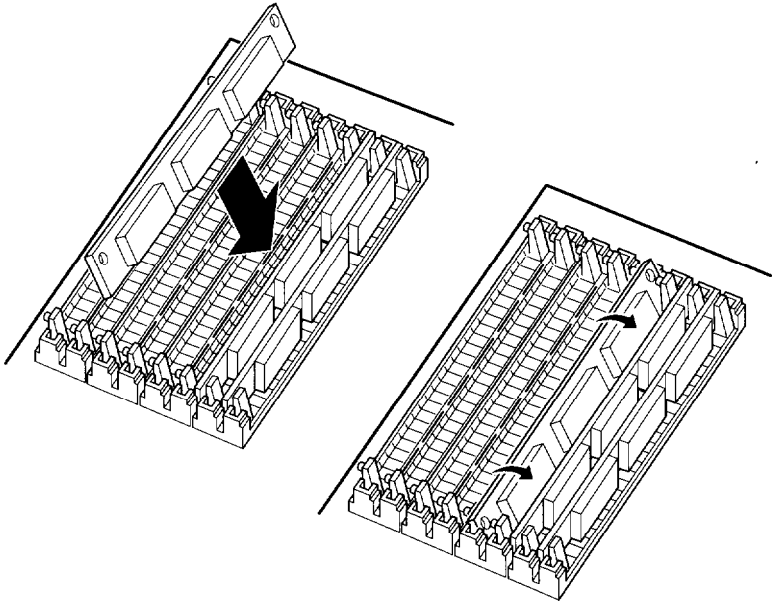
4. Push the SIMM into the socket until it is seated firmly in the slot. Then tilt it upright, as shown above, guiding the hole at each end of the SIMM over the retaining post at each end of the SIMM socket. If it does not go in smoothly, do not force it; pull it all the way out and try again.

5. Repeat steps 3 and 4 for each additional SIMM.

6. Replace any option cards you removed. (See page 3-13 for instructions.)

Removing SIMMs

If you need to remove SIMMs from your computer (to install different ones, for example), follow the steps below:

1. Remove any option cards that may be blocking your access to the SIMM sockets. (See page 3-16 for instructions.)

2. Use your fingers or a small screwdriver to carefully pull away the metal tabs that secure the SIMM at each end, as shown below. As you pull away the tabs, the SIMM falls to the side. Remove it from the socket.
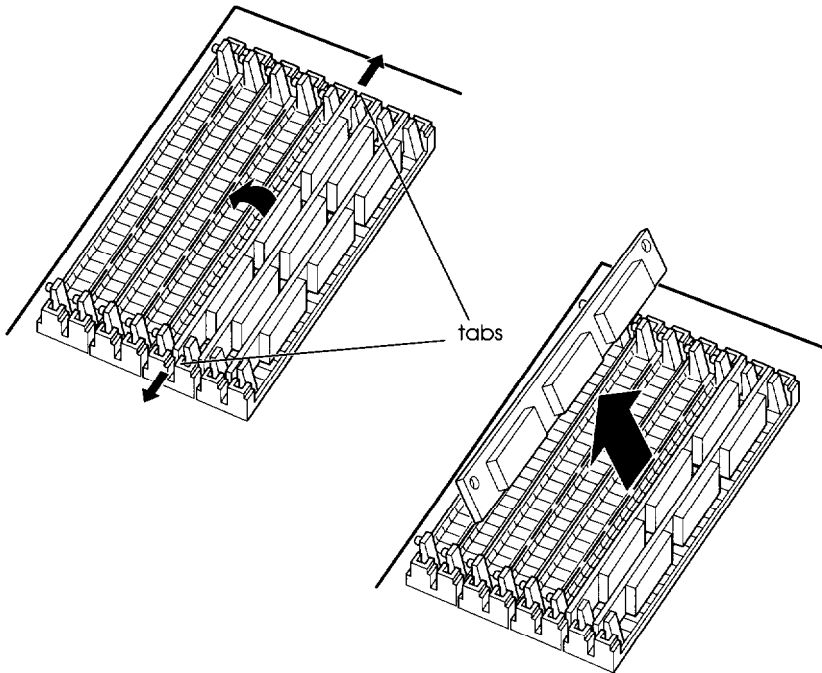
3. If necessary, follow the same procedure to remove the other SIMMs.

4. Replace any option cards you removed, as described below.

Installing an Option Card

This section explains how to install option cards in your
computer. Your computer has three 16-bit full-length slots and
two B-bit half-length slots to accommodate a total of five option
cards.

Usually it does not matter which slot an option card occupies as
long as the card fits in the slot. For example, you can place
some B-bit cards in a 16-bit slot. However, you cannot install a
16-bit card in an B-bit slot.

Caution

Make sure the power requirements for the option cards you
install do not exceed the power supply limitations. See your
option card manual(s) for the power requirements. Then
check Appendix A for the option slot power limits. Note that
older option cards that require -5 volts are not supported.

Before you install an option card, see if you need to change any
jumper settings on the system board. For example, if you install
a video card, you may need to change jumpers J11, J15, or J36
and J37. See page 3-6 for more information on jumpers.

Refer to the illustration below and follow these steps to install
an option card:

1. If you are using a 16-bit option slot, go on to step 2.

    If you are using an B-bit slot near the power supply, you need
    to remove the power supply before you can remove the
    metal slot cover.

Remove the two retaining screws securing the power supply to the back of the computer and the third retaining screw holding the power supply to the base of the computer. Be careful not to disconnect any of the cables. Slide the power supply out of the way.

2. Remove the retaining screws securing the option slot cover to the computer. (Keep the screw to secure the option card to the computer.)

3. Slide out the slot cover and set it aside. (Store it in a safe place in case you remove the option card later.)

4. Unpack the option card and adjust any switches or jumpers on it, if necessary. (Check the option card instructions.) When you handle the card, be careful not to touch any of the components on the circuit board or the gold-edged connectors. If you need to set it down before you install it, place it gently on top of its original packing material with the component side facing up. Keep the packing materials in case you remove the card later.

5. Hold the card along the top corners and guide it into the connector, as shown below. (If you are installing a full-length card, insert the front edge of the card into the corresponding guide inside the computer's front panel.)
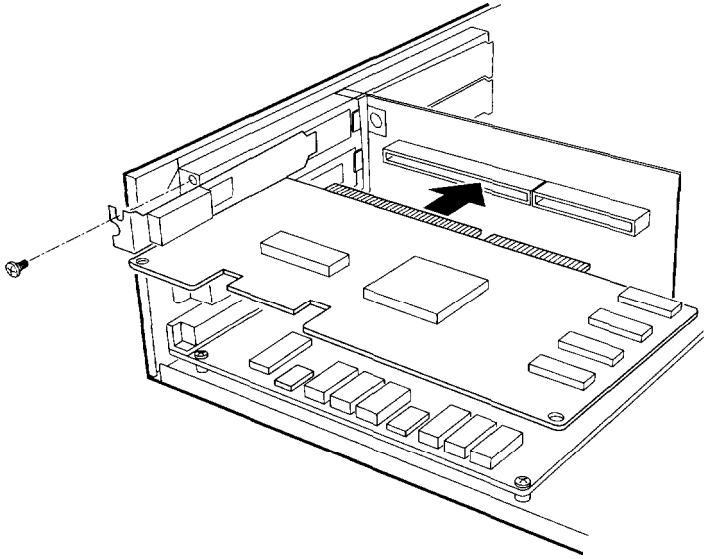
Once the connectors reach the slot, push the card in firmly (but carefully) to insert it fully. You should feel the card fit into place. If it does not go in smoothly, do not force it; pull the card all the way out and try again.

6. Secure the end of the card to the computer with the retaining screw.

Removing an Option Card

You may need to remove an option card installed in your computer to access components on the main system board-to change a jumper setting, for example. You may also want to remove a card if you no longer need it. Follow these steps:

1.   Remove the retaining screw securing the option card to the computer. Then pull the card straight out of the slot.

2.   Set the card aside with the component side facing up.

Adding Video Memory

Your computer comes with 256KB of video memory. You can increase your video memory to either 512KB or 1024KB by installing four or six video DRAM, 20-pin, 70ns or 80ns, 44256 DIP (Dual Inline Package) chips. This is useful for running graphics-intensive applications or for supporting resolutions up to 1024 x 768 on your monitor. See Appendix A for a table identifying supported colors and resolutions for each amount of video memory.

For the memory to work properly, you must install chips in the following configuration (each bank contains two video memory chips).

Video memory chip configuration

Bank 0	Bank 1	Bank 2	Bank 3	Total memory
Soldered				256KB*
Soldered	Filled			512KB
Soldered	Filled	Filled	Filled	1024KB

. Standard video memory

1. Locate the memory chip sockets on the main system board, shown on page 3-5.

    Bank 0 (labeled U24 and U40) contains two chips soldered to the system board, so you cannot add video memory in this bank. Bank 1 (U25 and U41) contains the two sockets closest to the soldered chips. Bank 2 (U32 and U46) is the two middle sockets in each set of three and Bank 3 (U33 and U47) contains the remaining two sockets.

2. If there is an option card in your way, remove it. See page 3-16 for instructions.

    > Caution
    > To avoid generating static electricity and damaging the memory chips, ground yourself by touching the metal surface on the inside of the computer's back panel. Then remain as stationary as possible while you install them.

3. Remove the memory chips from their package and inspect each one. The pins should point inward at slightly less than a 90 angle.

    If any of the pins are bent, straighten them gently with your fingers or with small tweezers to align them with the other pins. Be careful when you do this; the pins are fragile and can break off easily.

4. Position one of the memory chips over the first socket as shown below, aligning the pins on the chip with the holes in the socket. Make sure the small notch on the end of the chip is facing the outside of the computer.
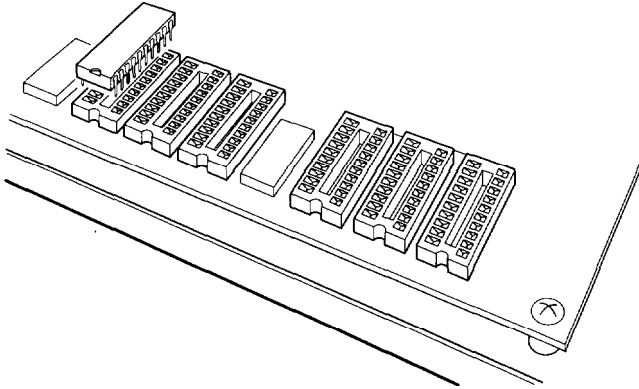
5. Gently press the chip halfway into the socket (to make sure it is correctly aligned). If the chip goes in at an angle, remove it with a chip puller or a small flat-head screwdriver and try again.

6. When the chip is properly positioned, push down firmly on both ends of the chip to make sure it is well-seated.

7. Repeat steps 4 through 6 for each of the remaining chips.

8. Replace any option cards you removed. See page 3-13 for instructions.

When you start your computer, it displays the video memory briefly before it begins its memory test.

Installing the Math Coprocessor

You can enhance your system's performance for some applications by installing an Intel 80387SX, 33 MHz, 68-pin PLCC type math coprocessor.

Follow these steps to install the math coprocessor:

1. Locate the socket for the math coprocessor. See page 3-5.

2. If there is an option card in your way, remove it. See page 3-16 for instructions.

> Caution
> Before you remove the math coprocessor from its antistatic packaging, touch an unpainted metal surface on the computer chassis. Do not touch the pins on the coprocessor. Handle the coprocessor only by the edges of its case.

3. Remove the coprocessor from its package and inspect it. If the pins appear bent, do not install the coprocessor.

4. Position the coprocessor over the socket as shown below. Align the notched corner of the coprocessor (marked with a dot) over the corresponding comer in the socket.

notched
corner
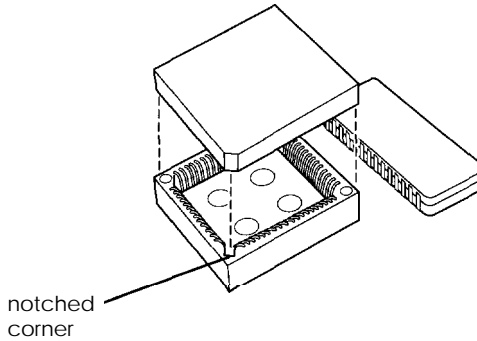
Caution

Be sure to align the pins in the coprocessor directly over the holes in the socket. If you insert the math coprocessor in the wrong position, you could permanently damage it.

---

5. Make sure the pins in the coprocessor are directly over the holes in the socket. Then gently push the coprocessor straight into the socket, pressing evenly on all sides.

6. Replace any option cards you removed. See page 3-13.

Post-installation Procedures

After you install or remove options such as memory modules or a math coprocessor, you must run SETUP to update the computer's configuration. See Chapter 1 for instructions. Additionally, you may need to add some commands to your configuration files. See your operating system manual and the manual that came with your optional equipment.

Chapter 4
Installing and Removing Drives

This chapter describes how to install and remove optional drives in your computer. You can use these instructions to install a variety of devices, including hard disk drives, a diskette drive, a tape drive, or a CD-ROM drive. Although your drive may look different from the ones illustrated here, you should be able to install it the same way.

Your computer can hold up to three mass storage devices. You can install a hard disk drive in the internal hard disk drive bay. In the upper horizontal bay, you can install a second hard disk drive (if you have the right cable), a second diskette drive, a tape drive, or a CD-ROM drive.

To install or remove a drive, first remove the computer's cover as described in Chapter 3. Then use the instructions below to install a hard disk drive in the internal hard disk drive bay or follow the instructions on page 4-11 to install any type of drive in the upper horizontal bay.

If you are installing or removing a non-Epson drive, some of the steps in this chapter may not apply; see the documentation that came with your drive for more information.

Installing a Hard Disk Drive in the Internal Drive Bay

Your computer may have a hard disk drive already installed
using the hard disk drive mounting bracket. If not, you can
install a l-inch (third-height), 3½-inch wide drive below the
mounting bracket or above it.

Here you will find steps for the following procedures:

❏ Removing the mounting frames from the hard disk drive
   (if necessary)

❏ Connecting the hard disk drive cables

❏ Installing the hard disk drive under the mounting bracket
   (for third-height drives)

❏ Installing the hard disk drive on the mounting bracket.

Note
Be sure to check the jumper settings on the drive before you
install a hard disk drive. Also, you will need to know the
number of cylinders, heads, sectors, etc. to select the correct
drive type in the SETUP program. See the documentation
that came with your drive for this information.

Before you can install a hard disk drive, you need to remove
any option cards that may be blocking your access to the hard
disk drive area. Once you have installed the drive, replace any
option cards you removed. See Chapter 3 for instructions.

Removing the Mounting Frames

If there are mounting frames attached to your hard disk drive, you need to remove them before you can install the drive. Follow these steps:

1. On your drive, there may be a plastic guiderail and metal grounding plate attached to one of the mounting frames. If so, remove the screws securing them to the mounting frame and remove the guiderail and grounding plate.

plastic guiderail

metal grounding plate
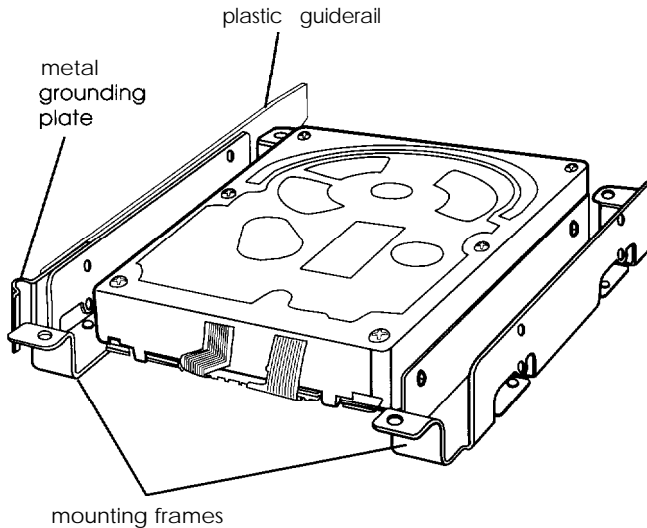
mounting frames

2. Then remove the two screws securing each mounting frame to the drive and remove the frames.

Connecting the Hard Disk Drive Cable

To connect the hard disk drive to the computer, you need to connect two cables: the hard disk drive ribbon cable and a power supply cable. You should connect these cables before you secure the drive with the mounting bracket because you will not be able to attach them once the bracket is in place.

Connecting the Drive Cable to the System Board

If you need to connect the hard disk drive ribbon cable to the system board, follow the steps below. (If the hard disk drive ribbon cable is already attached to the system board, refer to "Connecting the Drive and Power Cables to the Drive" on page 4-5.)

1. Locate the hard disk drive connector on the system board.
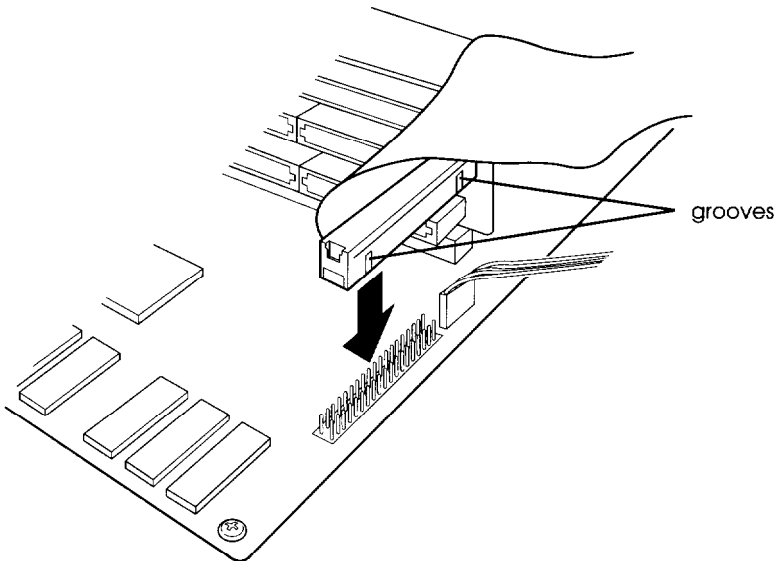
grooves

2. Locate the hard disk drive ribbon cable; it is a flat cable with a connector on each end.

3. Select one of the connectors. Notice the two grooves in one side of the connector. Align the connector so that these grooves face the hard disk drive bay.

4. Make sure the holes in the cable connector fit over the pins in the system board connector; then push in the cable connector.

> **Caution**
> If you do not correctly align the holes with the pins, you
> could severely damage your system board when you push in
> the cable connector.

Connecting the Drive and Power Cables to the Drive

Follow the steps below to connect the hard disk drive ribbon
cable and a power supply cable to the drive:

1. Locate the free connector on the end of the hard disk drive
    ribbon cable.

2. Locate pin 1 on the drive connector. If you do not see it on
    the connector casing, turn the drive over so you can see the
    drive's circuit board. You will see a 1 or 2 printed on the
    board to identify the side of the connector containing pin 1.

3. Align the connector on the cable so that the red wire will be
    closest to pin 1 on the drive.

4. Make sure the holes in the cable connector fit over all the
    pins in the hard disk drive connector; then push in the
    connector.

    > **Caution**
    > If you do not correctly align the holes with the pins, you
    > could severely damage your hard disk drive when you
    > push in the cable connector.

5. Locate one of the power supply cables that lead from the
    power supply. (They have multi-colored wires and a plastic
    connector on the end.)

6. Position the power supply cable connector so that its notched corners line up with the notched corners of the power supply connector on the hard disk drive.

notched corners
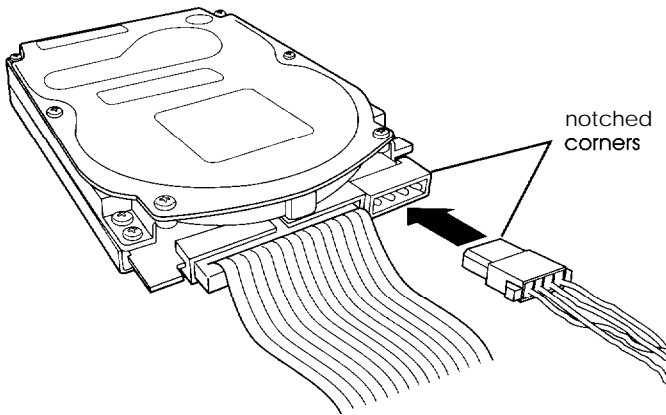
7. Make sure the holes fit over all the pins and then push in the connector.

Caution
If you do not align the cable connector correctly, you could severely damage your hard disk drive when you push it in.

Installing the Hard Disk Below the Mounting Bracket

If you have a third-height hard disk drive, you can install it below the hard disk drive mounting bracket. Refer to the illustrations below and follow these steps:

1. Remove the screw securing the mounting bracket to the base of the computer.

2. Slide the mounting bracket toward the diskette drive bays until the slots clear the tabs.
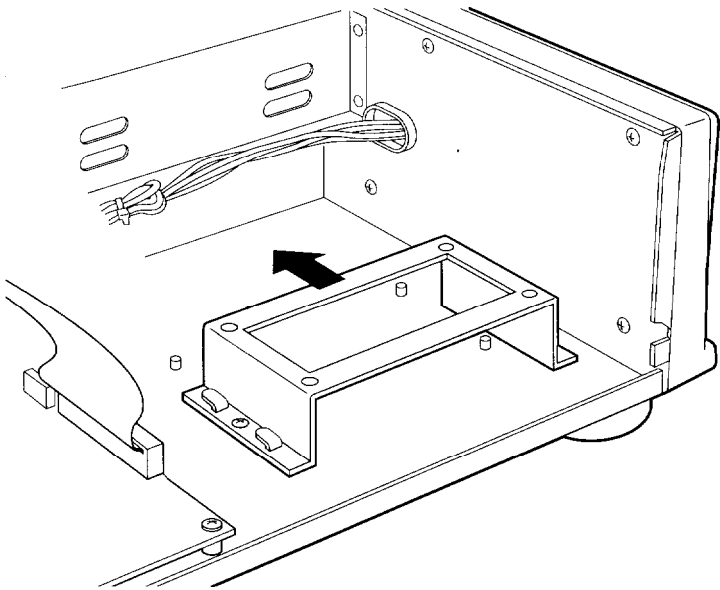
3. Lift the mounting bracket out of the computer and set it aside.

4. Align the hard disk drive so that the cable connectors are facing the diskette drive bays and the four holes at the base of the drive are above the four pegs, as shown below.
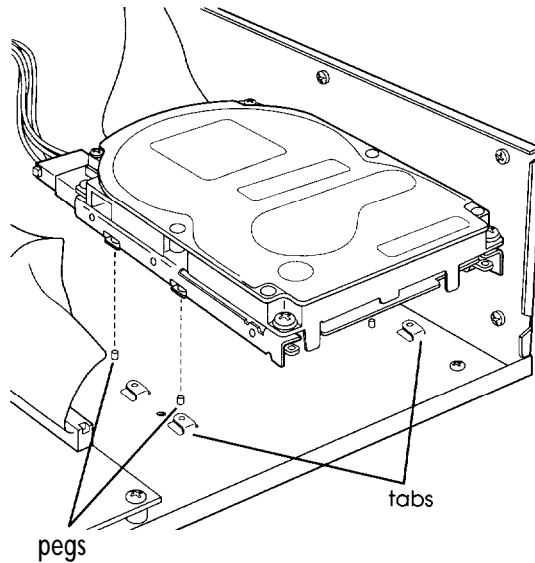
5. Gently lower the drive over the pegs. When the hard disk drive is resting on the pegs, it will not move from side to side.

6. Lower the mounting bracket over the hard disk drive, making sure that the tabs on the computer align with the slots in the mounting bracket.

7. Slide the bracket toward the side of the computer until the tabs hold the bracket secure.
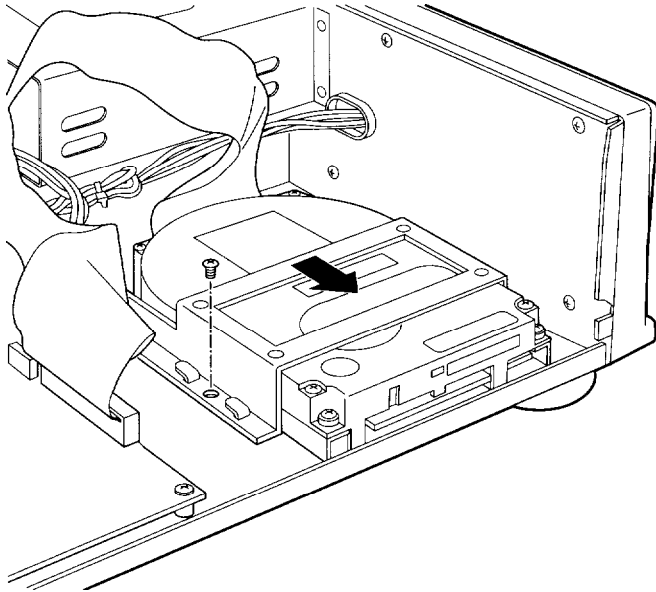
8. Secure the mounting bracket with the screw, as shown above.

Installing the Hard Disk On the Mounting Bracket

You can also install a hard disk drive on top of the mounting bracket rather than under it. Refer to the illustration on page 4-7 and the one below while following these steps:

1. Remove the screw securing the mounting bracket to the base of the computer.

2. Slide the mounting bracket toward the diskette drive bays until the slots clear the tabs.

3. Lift the mounting bracket out of the computer.

4. Turn the hard disk drive over and locate the four mounting holes on the drive.

5. Position the bracket on the hard disk drive, aligning the holes in the bracket with the holes on the drive.
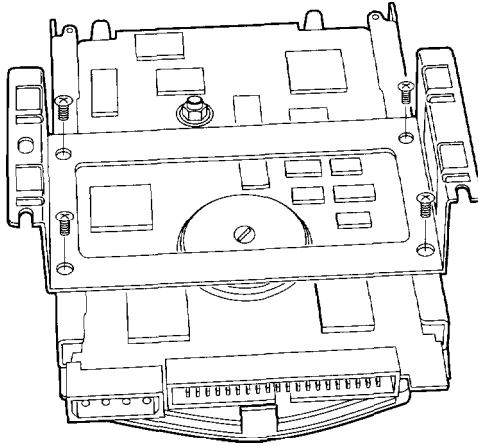
6. Secure the bracket to the drive with four screws.

7. Lower the slots on the mounting bracket onto the tabs on the computer.

8. Slide the bracket toward the side of the computer until the tabs hold the bracket secure.

9. Secure the mounting bracket with the screw.

Removing a Hard Disk Drive From the Internal Drive Bay

To remove a hard disk drive, reverse the installation steps outlined above. Then disconnect the hard disk drive ribbon cable and the power supply cable from the back of the drive. When you disconnect the cables, grasp the connectors and pull them straight out so you do not bend the pins; do not pull on the cables. Use the screw to again secure the hard disk drive mounting bracket to the base of the computer.

Installing a Drive in the Upper Horizontal Drive Bay

Your system comes with a 3.25-inch diskette drive installed in the lower horizontal drive bay. You can also install a diskette drive, a CD-ROM, a tape drive, or a second hard disk drive in the upper horizontal drive bay. If you install a second hard disk drive in this bay, make sure you purchase the appropriate cable to connect both drives to the hard disk drive connector.

Before you install a drive in the upper drive bay, remove the cover. Once you have the drive installed, replace the cover, following the instructions in Chapter 3.

Follow these steps to install a drive in the upper horizontal drive bay:

1. Remove the faceplate from the bay. Place your hand behind the plate through the hole in the drive bay, and push the faceplate forward, as shown below.
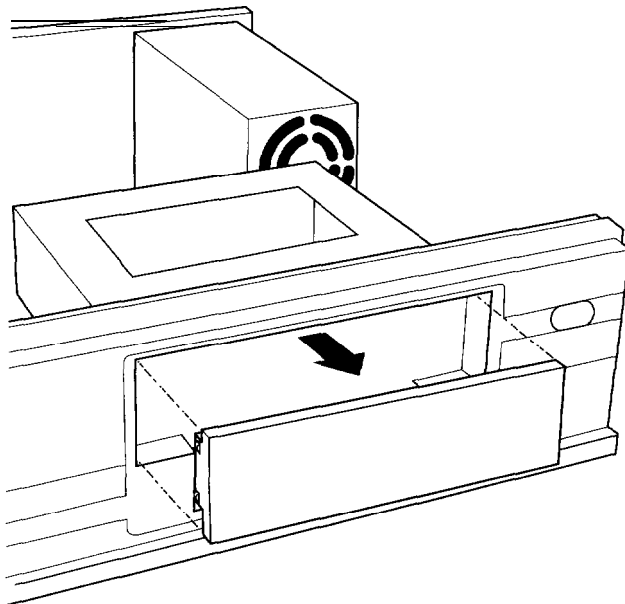
Keep the faceplate in a safe place in case you remove a drive later.

2. Remove any brackets or mounting frames from the drive.

3. Slide the drive into the bay as far as it will go.
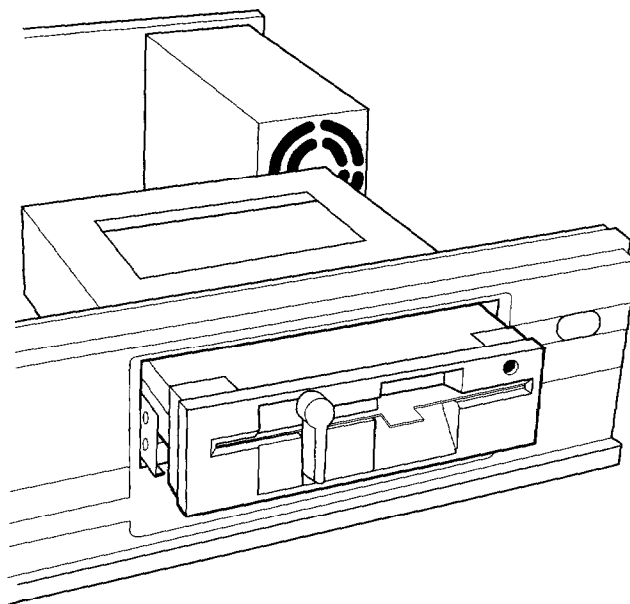
4. The side of the drive bay contains slots that correspond to the mounting holes in the drive. Secure the drive using retaining screws in both sides of the drive.

Connecting the Drive and Power Cables

To connect the drive to the computer, you need to connect both
the drive ribbon cable and a power supply cable. Follow the
steps below.

1. If you are installing a diskette drive, locate the diskette drive
   ribbon cable. The middle of the cable is connected to the
   system board.
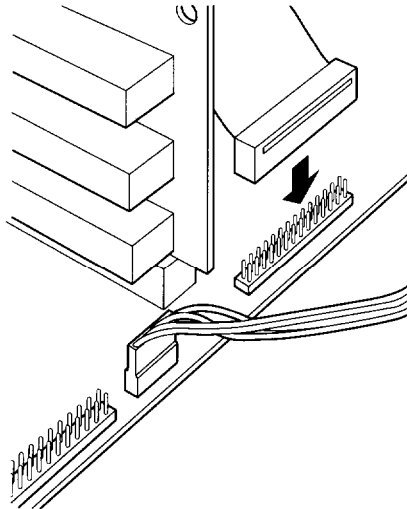
If you are installing a second diskette drive, one end of
the cable is connected to the bottom diskette drive. The
cable contains both a card-edge connector and a header
connector.

If you are installing a hard disk drive in the upper horizontal bay, make sure you use the proper hard disk drive ribbon cable and connect the drive to the hard disk drive connector. Also, if this is the second hard disk drive in your system, make sure you set the jumpers on both hard disk drives to indicate which is the master and which is the slave drive.

2. If the drive connector extending from the back of the drive has gold contacts on both sides, use the card-edge connector on the ribbon cable. Make sure you align the key-way (the plastic divider) with the gap in the drive connector.

    If the drive connector contains a series of pins, use the header connector. Identify pin 1 on the drive and align the connector so that the red wire is at pin 1.

3. Locate one of the power supply cables that lead from the power supply. (They have multi-colored wires and a plastic connector on the end.)

4. Position the power supply cable connector so that its notched comers line up with the notched corners of the drive's power supply connector. Make sure the holes fit over all the pins and then push in the connector.

notched
corners
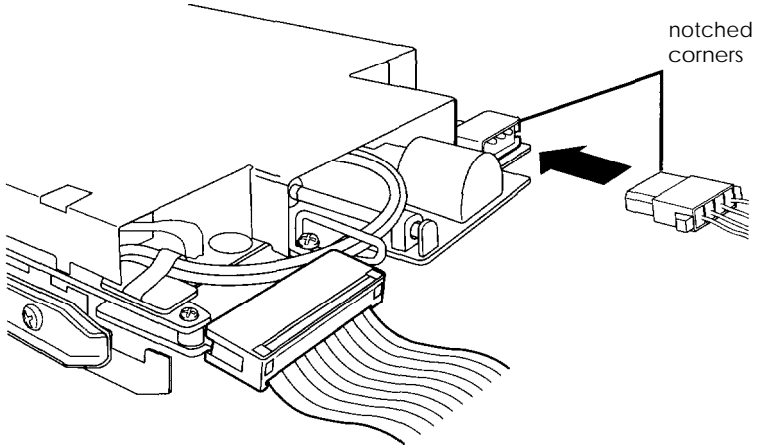
Caution
If you do not align the cable connectors correctly, you could severely damage your drive when you push them in.

If you installed a diskette drive in the upper bay, it is drive B; the lower drive is A. However, if you want to reassign the upper diskette drive as drive A, you can change jumpers J17 through J20. See Chapter 3 for instructions.

Removing a Drive from the Upper Drive Bay

To remove a drive from the upper drive bay, follow these steps:

1. Remove both the ribbon cable connector and the power cable connector from the drive.

2. Remove the screws securing the drive.

3. Reach behind the drive and gently push it to the front of the bay; then pull it out of the slot.

4. Once you have removed the drive, replace the faceplate by inserting one side of the plate, then gently guiding the other side into place. You will hear it snap into place.

Post-installation Procedures

After you install or remove your drive(s) and replace the cover on your computer, you need to run the SETUP program to define the correct configuration for your newly-installed drive. See Chapter 1 for instructions.

Chapter 5
Installing Video Drivers

The Utility diskettes included with your system contain
enhanced VGA (video graphics array) drivers and utilities for
your computer's built-in VGA adapter. This chapter describes
how to install and use these drivers and utilities.

Your computer's built-in VGA adapter is compatible with IBM
VGA. The drivers and utilities described in this chapter work
with any VGA and compatible, multifrequency monitors that
use analog input.

Standard VGA monitors display resolutions up to 640 x 480,
and you do not need to install the drivers or utilities for your
system to operate properly with your application programs at
this resolution.

However, if you want to use resolutions over 640 x 480 or take
advantage of the following special features when using certain
application programs, you need to install the appropriate
drivers:

❏ Enhanced graphic and text modes in 4, 16, and 256 colors

❏ Resolutions up to 1024 x 768

❏ Extended text mode for 132-column text with 25, 30, 43, and
60 rows.

Your computer comes with 256KB of video memory installed
on the system board. You can upgrade the video memory to
either 512KB or 1MB by installing additional video memory
chips, allowing you to use higher resolutions and more colors.
See Chapter 3 for installation instructions.

This chapter describes installation procedures for the following common applications:

❏ Lotus 1-2-3 and Symphony, version 2.x (see page 5-3)

❏ Microsoft Windows, version 3.1 (see page 5-4)

❏ Microsoft Word, version 5.0 (see page 5-5)

❏ Quattro Pro, version 2.x (see page 5-6)

❏ WordPerfect, version 5.1 (see page 5-7)

Your Utility diskettes contain VGA utilities and drivers for additional applications. If you want to install these utilities or an extended video driver for an application not listed above, read the README files on your Utility diskettes. These files will tell you what additional applications are supported and will describe the VGA utilities.

Installing the Drivers

The information in this guide is organized alphabetically by application program or operating environment. To install a particular driver, turn to the page listed above for your application or environment.

Note
Each of the VGA drivers is designed to work with a specific version of software. Make sure the driver you select is compatible with the version of software you are using, or you may get unpredictable results.

Lotus 1-2-3 or Symphony

If you have not yet installed Lotus 1-2-3 or Symphony, follow the instructions in your Lotus documentation to install it. Then follow these steps to install the drivers:

1. Insert Utility Diskette 1 in drive A.

2. Type **A** : and press Enter to log onto drive A.

3. Copy the drivers from the Utility Diskette 1 to the Lotus or Symphony program directory on your hard disk.

    If you are installing drivers for 1-2-3 to the C:\LOTUS directory, type the following and press Enter:

    SET123 C:\LOTUS

    If you are installing drivers for Symphony to the C:\SYMPHONY directory, type the following and press Enter:

    SETSYMPH C:\SYMPHONY

4. Log onto your Lotus program directory.

5. Type **INSTALL** and press Enter to run the installation program.

6. From the main menu, **select Advanced options** and press Enter.

7. Then **select Add new drivers to library** and press Enter.

8. When the program finishes adding drivers to the library, select **Modify current driver** set and press Enter.

9. Select Text display to modify the text mode or Graphics display to modify the graphics resolution. Then press Enter.

10. Select the TVGA driver you want to install from the displayed list and press Enter.

11. Select Return to menu and press Enter.

12. At the Installation menu, select Save changes.

13. At the prompt, type the name you want to use for the driver set and press Enter.

14. Exit the Install program.

15. When you start 1-2-3 or Symphony, type **123** or SYMPHONY, followed by the name of the driver set you want to use, and then press Enter.

Microsoft Windows

If you have not yet installed Windows 3.1, follow the instructions in your Windows documentation to install it with the standard VGA driver. Then follow these instructions to install the new driver:

1. Log onto your Windows program directory.

2. Type SETUP and press Enter.

3. At the System Information screen, select Display and press Enter.

4. From the Display menu, select Other (Requires disk provided by hardware manufacturer) and press Enter.

5. Insert the Utility Diskette 1 in drive A.

6. Type the following path:

    A:\WIN

7. Select the driver you want to install.

8. Follow the instructions on the screen to finish running SETUP.

Note

All Windows driver files are compressed using Microsoft COMPRESS. If you install the drivers to or from a network server, you must expand all driver files by using Microsoft EXPAND. See your Windows documentation for instructions.

Microsoft Word

If you have not yet installed Word 5.0, follow the instructions in your Word documentation to install it. Then follow these instructions to install the appropriate driver:

1. Log onto your Word program directory.

2. Rename the driver file SCREEN.VID to the name SCREEN.OLD.

3. Insert the Utility Diskette 1 in drive A.

4. Copy the SCREEN.VID file from the diskette to your Word program directory. Type the following command and press Enter to copy the file:

    COPY A:\WORD\SCREEN.VID

5. Start your Word application.

6. Press Esc to enter a command.

7. Press 0 to enter an Option command.

8. **Select Display Mode.**

9. Press F1 to list the display modes available. Choose one
   of the following display modes to indicate the number of
   rows for your display:

   ```
   1 Text,  25 lines,  16 color
   2 Text,  43 lines,  16 color
   3 Text,  50 lines,  16 color
   4 Text,  60 lines,  16 color
   5 Text,  25 lines,  16 color*
   6 Text,  30 lines,  16 color*
   7 Text,  43 lines,  16 color*
   8 Text,  60 lines,  16 color*
   ```

*These are 132-column modes and provide no mouse support.

Press 1 to see additional drivers.

Your Word application now uses the display mode you
selected.

Quattro Pro

If you have not yet installed your Quattro Pro application,
follow the instructions in the Quattro Pro documentation to
install it now. Then follow these steps to install the extended
VGA drivers for Quattro Pro:

1. Log onto your Quattro Pro directory.

2. Insert the Utility Diskette 1 in drive A.

3. Type the following command and press Enter to copy the new display drivers to your Quattro Pro directory:

    COPY A:\QPRO\VIDEO.RSC

4. Start your Quattro Pro application.

5. Type /O to select the Options menu.

6. Type D to display the available display mode drivers.

7. Select Trident VGA.

8. Select the extended text mode you want to use.

Your Quattro Pro application now uses the display mode you selected.

WordPerfect

If you have not yet installed WordPerfect 5.1, follow the instructions in your WordPerfect documentation to install it. Then follow the instructions below to install the new drivers.

1. Log onto the WordPerfect directory on your hard disk.

2. Insert the Utility Diskette 1 in drive A.

3. Copy the extended text and graphics drivers from the utility disk to your WordPerfect directory by typing:

    COPY A:\WP51*.VRS

4. Start your WordPerfect application.

5. Press Shift F1 to display the Setup menu.

6. Select Display.

7. Select Graphics **Screen Type.**

8. Choose Trident TVGA.

9. Select one of the extended graphics drivers. Choose from 800 x 600, 16 colors; 1023 x 768, 16 colors; and 786 x 1024, 16 colors.

10. Now select **Text Screen Type.**

11. Choose Trident VGA.

12. Select the resolution you want for your text driver.

13. Press F7 to exit. Your selection is saved and used for displaying text as well as the print preview and graphics functions of WordPerfect.

Chapter 6

Troubleshooting

If you have any problems as you set up and use your computer, refer to this chapter. You can correct most problems by adjusting a cable connection, repeating a software procedure, or resetting the computer.

The troubleshooting suggestions in this chapter are organized in general categories, such as "The computer will not start." Within each category, a more specific problem is described with possible solutions.

If the suggestions here do not solve the problem, contact your Epson dealer.

Identifying Your System

When you request technical assistance, be ready to provide the serial number of your computer, its system BIOS version number, its configuration (including the type of disk drives, monitor, and option cards), and the names and version numbers of any software programs you are using.

Use the following table to locate this information.

Location of system information

System information	Location
Serial number	On the back panel of the computer
Video BIOS version	On the screen during power-on diagnostics
System BIOS version	On SETUP System Information screen
System configuration	On SETUP screens
DOS version	In response to the DOS VER command
Software versions	In application banner screen; in "About" application window; within application documentation

The Computer Will Not Start

The power light is on, but the computer does not start.

Replace your main operating system diskette and turn on the computer again.

> **Caution**
> If you turn off the computer, always wait at least 20 seconds before turning it back on. This prevents damage to the computer's electrical circuitry.

The computer does not start and the power light is not lit.

Make sure the power cord is securely connected to both the AC inlet on the back panel and an electrical outlet.

*The power cord is securely connected, but the computer
still does not staff.*

Check the electrical outlet for power. Turn off your computer
and unplug the power cord. Plug a lamp into the outlet and
turn it on.

*You installed of removed system components, and now
your computer does not staff.*

Check to make sure you have reconnected all the internal and
external cables correctly.

The Computer Does Not Respond

The computer locks up.

Wait a few moments; if your computer does not respond after a
reasonable length of time, turn it off, wait 20 seconds, and try
again.

You may have installed memory using SIMMs that work at the
wrong speed. You can try using the SETUP program to insert a
wait state (see Chapter 1) or you can install the correct SIMMs
(see Chapter 3).

*You turned the computer off and on again, but it still does
not respond.*

Try resetting the computer using the Ctrl Alt Del command.

Your computer suddenly stops operating.

You may have overloaded the power supply limitations. See
your option card manual(s) for the power requirements for
your option card(s). Then check Appendix A to see if you have
exceeded the option slot power limits.

Keyboard Problems

The screen displays a keyboard error message when you turn on of reset the computer.

Make sure the keyboard is securely connected to the correct port.

Nothing happens when you type on the keyboard.

See "The Computer Does Not Respond," above.

The cursor keys on the numeric keypad do not work properly.

If the Num Lock light in the upper right corner of the keyboard is lit, press NumLock to turn off the function.

If you want to change the initial settings of the num lock function, see "Setting the NumLock On at Boot" in Chapter 1.

Monitor Problems

There is no display on the screen.

Check that the monitor's power switch is on and that its power light is lit.

The power light is on, but you still do not see anything on the screen.

Check the brightness and contrast controls.

If you still do not see anything on the screen, make sure you connected your monitor to the computer securely.

If you installed a display adapter card, make sure your monitor and display adapter match. Also check to see if the card's switches or jumpers and the jumpers on the system board are set properly. See Chapter 3 for system board jumper information.

If you are running an application program, see if you need to set up the program for the type of monitor and display adapter you have. Also make sure you are using the appropriate monitor and display adapter for your software.

> **Note**
> If your application program requires a monitor that supports graphics but you have a monochrome monitor, the results will be unpredictable.

The power switch is on but the power light is not on.

Turn off the monitor's power, wait five seconds, and turn it back on.

If the light still does not come on, check the electrical outlet for power. Turn off your monitor and unplug it from the outlet. Then plug a lamp into the wall outlet and turn it on. If the light turns on, your monitor may be faulty.

Diskette Problems

You see a diskette error message.

> Reinsert the diskette, making sure you insert it all the way. If the drive has a latch, turn it down to secure the diskette.

> Also, check to see that you have inserted the right type of diskette in the drive. For example, make sure you are not inserting a high-density diskette in a double-density drive.

Reinserting the diskette does not solve the problem.

> Insert the diskette in another diskette drive of the same type. If you can read the diskette in a different drive, your drive may be faulty.

The diskette is the right *type*, but you still see an error.

> Check that the diskette is not write-protected, preventing the drive from writing to the diskette.

> Make sure the diskette is formatted. See your operating system documentation for instructions on formatting diskettes.

> You may have a defective diskette. Try copying the files from the bad diskette to a new diskette.

Something *is wrong with the data in the files.*

> If you are using DOS, use CHKDSK to repair the files. You may also be able to use special utilities or diagnostics to solve this problem.

Diskette Drive Problems

A newly-installed diskette drive is not working properly.

Make sure you have installed the drive correctly and check all
the cable connections.

You see a diskette drive error when you start your computer.

Run the SETUP program and configure your system for the
correct type of diskette drive.

The diskette drive is making loud or unusual noises.

Contact your dealer or service representative.

Hard Disk Drive Problems

A newly-installed hard disk drive is not working properly.

Make sure you have installed the drive correctly and check all
cable connections. Also, check the jumper settings on your
drive.

You see a hard disk drive error when you start your system.

Run SETUP and update your system configuration for the hard
disk drive. Make sure you selected the correct drive type.

Make sure the jumpers on the system board are set correctly.
See Chapter 3 for jumper information.

You are unable to store data on the hard disk drive.

Make sure you have partitioned and formatted the drive
correctly for your operating system. Use the procedures
provided in your operating system manual.

Also, make sure your hard disk drive has been physically formatted by the manufacturer. If it has not been physically formatted, use the format utility that came with the drive to format it.

Note that a physical format is different from software-based formatting commands, such as the DOS FORMAT command.

You have been using your hard disk drive successfully for some time but notice a reduction in performance.

The data on the disk may have become fragmented. Back up all your data and use a disk compaction utility to reorganize the files on your disk.

If you cannot access data on your hard disk or you are seeing read/write errors, the disk may have a physical problem. Contact your dealer.

Software Problems

The application program does not start.

Check that you are following the correct procedure for starting the program and that it is installed correctly. If you do not have a hard disk, make sure the correct diskette is in the diskette drive.

The application program is having trouble reading a key disk.

You may be running an application that requires a slower processor speed. See Chapter 2 for information on setting the processor speed.

*Your application has locked the computer, making if
unresponsive to keyboard commands.*

Reset the computer and try again. If resetting the computer
does not help, turn it off, wait 20 seconds, then turn it on again.

Some software, like OS/2, Unix, or NetWare 3.11, needs a
minimum of 4MB to 8MB of RAM to work correctly. Check
your software documentation for the minimum memory
requirements. If necessary, add additional memory using the
instructions in Chapter 3.

Printer Problems

The printer does not work at all.

Check that the printer has power and is properly connected to
the computer. Also make sure your printer has paper in it.

The printer prints garbled information.

Check the printer manual for the printer's correct DIP switch or
control panel settings.

Also, make sure you have the proper drivers installed for your
printer.

Option Card Problems

A new/y installed option card is not working correctly.

Make sure the option card is installed correctly and is
well-seated in its slot. Run the SETUP program to update your
computer's configuration after you install the card. Also,
perform setup procedures for any software you are using with
the option card.

Also, see the documentation that came with the option card to set any necessary DIP switches or jumpers on the card.

The main system board of your computer may also have some jumpers that must be set for the option card to work properly. See Chapter 3 for system jumper information.

Your system may need to operate at the slower processor speed to access the device. Try reducing the processor speed (see Chapter 2) or inserting a wait state through the SETUP program (see Chapter 1).

You may have inserted an older option card that works at -5 volts. Make sure you install option cards that meet the system's power requirements.

An external device connected to the option card is not working correctly.

Make sure you are using the proper cable to connect the device to the card.

Memory Module Problems

The memory count displayed by the power-on diagnostics program is incorrect.

You may have installed the SIMMs incorrectly. They may be the wrong type or speed, or they may not be inserted all the way. See Chapter 3 for information on installing SIMMs.

Controller Problems

You see a controller error for the hard disk drive controller, the video controller, or the I/O port controllers when you start your system.

The indicated controller on your system board may be faulty. If you have an option card with a controller that will work with your device, you can install it and change the jumper settings on the system board to disable the built-in controller. You can then continue to use your system until it is convenient for you to have it serviced.

Mouse Problems

Your mouse isn't working properly or you see an auxiliary device error message.

Make sure the mouse cable is securely connected to one of the serial ports. Also make sure you installed the mouse driver correctly and selected the right settings for the serial ports in the SETUP program. See the documentation that came with your mouse and Chapter 1 for instructions.

Appendix A
Specifications

CPU and Memory

32-bit CPU	Intel or AMD 80386SX, 33 MHz microprocessor with 16-bit data bus
System speed	High and low speeds available; high speed is 33 MHz, low speed is 8 MHz; speed selection through SETUP program and keyboard commands; zero wait state memory access at high speed; wait states of zero or one selectable through SETUP
Memory	2MB or 4MB RAM standard on SIMMs; expandable to 16MB using 256KB, 1MB, and 4MB SIMMs; SIMMs must be 30-pin, fast-page mode type with 70ns or faster access speed
ROM	64KB system BIOS, video BIOS, and SETUP code located in EPROM on main system board
Video RAM	256KB DRAM on main system board; expandable to 512KB or 1024KB using 70ns or 80ns 44256 DIP chips
Shadow RAM	Supports shadowing of system and video BIOS ROM into RAM
Math coprocessor	Optional 80387SX, 33 MHz coprocessor available

Clock/ calendar	Real-time clock, calendar, and CMOS RAM socketed on main system board with built-in battery backup

Controllers

Video	Trident VGA controller on main system board; provides resolutions up to *1024 x 768* in 16 colors
Diskette	Controller on main system board supports up to two diskette drives
Hard disk	Interface on main system board supports up to two IDE hard disk drives with built-in controllers

Interfaces

Monitor	VGA interface built into system board; 15-pin, D-shell connector
Parallel	One standard 8-bit parallel, uni-directional interface built into main system board; 25-pin, D-shell connector
Serial	Two RS-232C, programmable, asynchronous interfaces built into main system board; 9-pin, D-shell connectors
Game	One 15-pin, D-shell connector
Keyboard	PS/2 compatible keyboard interface built into main system board; num lock setting selectable through SETUP; 6-pin, mini DIN connector

Option slots	Three 16-bit full-length and two B-bit half-length I/O expansion slots, ISA compatible, 8 MHz bus speed
Speaker	Internal
Mass storage	Two 3 1/2-inch wide drives (one internal mount) and one 5 1/4-inch wide, half-height drive
Diskette drives	3.5-inch diskette drive, 1.44MB (high-density) storage capacity
	5.25-inch diskette drive, 1.2MB (high-density) storage capacity
	3.5-inch diskette drive, 720KB (double-density) storage capacity
	5.25-inch diskette drive, 360KB (double-density) storage capacity
Hard disk drives	3 1/2-inch form factor hard disk drive(s), up to half-height size; the first mounted internally, and second mounted in the horizontal drive bay
Other devices	Half-height tape drive, CD-ROM, or other storage device; 5 1/4-inch or 3 1/2-inch with mounting frames

Physical Characteristics

Width	15.6 inches (396 mm)
Depth	14.5 inches (368 mm)
Height	4.1 inches (104 mm)
Weight	15 lb (6.8 kg), without drives or keyboard

Power Supply

Type	65 Watt, fan-cooled
Input ranges	*90 to 260* VAC
Maximum outputs	+5 VDC at 7.5 Amps, +12 VDC at 2.0 Amps, -12 VDC at 0.3 Amps
Frequency	*47* to 63 Hz

Option Slot Power Limits (Total)

Maximum current*	+5 **Volts**	+ 12 Volts	- 12 Volts
For all slots	4.6 Amps	1.8 Amps	0.3 Amps

* This system does not support older option cards that may require -5 volts.

Video Memory and Supported Resolutions

Memory	Resolutions	Colors
256KB	640x480 800x600 1024x768	16 16 4
512KB	640x480 800x600 1024x768	256 256 16
1MB	640x480 800x600 1024x768	256 256 256

Environmental Requirements

Condition	Operating range	Non-operating range	Storage range
Temperature	41° to 90°F (5° to 32°C)	-4° to 140°F (-20° to 60°C)	-4° to 140°F (-20° to 60°C)
Humidity (non-condensing)	20% to 90%	10% to 90%	10% to 90%
Altitude	-330 to 9,900 ft (-100 to 3.000 m)	-330 to 39,600 ft (-100 to 12,000 m)	330 to 39,600 ft (-100 to 12,000m)

Tested Operating Environments

Although your system will run most software applications, the following operating environments have been tested for compatibility with your system. As new environments become available, these also will be tested.

MS-DOS 3.3 through 6.0
DR DOS 6.0
Novell NetWare 4.0
Novell NetWare 3.11*
Novell NetWare 2.2*
Novell-ELS NetWare level II 2.12*
Novell NetWare 386 3.1*
OS/22.1
OS/2 Extended Version 1.1/l.2
SCO Unix 3.2 V 4.0n
SCO Xenix V 1.1.2/2.3.3
SCO Open Desktop 2.0
SCO Open Desktop V
Windows 3.1
Windows 3.0

*   File server and workstation.

Available Options

The following list represents only a few of the options supported for this product. Call your nearest marketing location or Epson Direct for more information on specific options.

Options

Option	Product	Product code
Monitors	14″ VGA monochrome monitor	A880611
	14″ VGA color monitor, 0.39 mm	A804321
	14" Extended color VGA monitor	A804211
	17″ Professional Series monitor	A804241
	20" Professional Series monitor	A804341
Keyboards	101 USA	A800181
	102 International keyboard	
Mouse	9-pin serial mouse	A880282
Mass storage devices		
Additional diskette drives	**5.25″** 1.2MB FDD	A811371
	3.5″ 1.44MB FDD	A811381
Hard disk drives	80MB HDD w/embedded AT controller	A812001
	120MB HDD w/embedded AT controller	A811951
	170MB HDD w/embedded AT controller	A880861
	240MB HDD w/embedded AT controller	A811991
CD-ROM	Half-height CD-ROM	
Tape backup drive	Epson 250MB tape backup unit	A811613
Memory expansion kits		
System memory	1MB SIMMs (256KB x 9,70ns. 4 pieces)	A808831
	2MB SIMMs (1MB x 9,70ns. 2 pieces)	A808841
	8MB SIMMs (4MB x 9,70ns. 2 pieces)	A808631
Video memory	44256 DIP chips with 70ns or 80ns access speed	
Other		
Network cards	Standard network interface card	
Math coprocessor	80387SX, 33 MHz. 68-pin. PLCC coprocessor	

Options   (continued)

Option	Product	Product code
Printers		
?-pin	Epson LX-810, narrow carriage	C016231
	ActionPrinter 2250, narrow carriage	I C100011
	FX-870, narrow carriage	C094001 I
	FX-1170, wide carriage	C095001
	DFX-5000, wide carriage	I C112001
	DFX-8000, wide carriage	C030001 I
24-pin	ActionPrinter 3250, narrow carriage	C092011
	LQ-570. narrow carriage	C062001
	LQ-860, narrow carriage	C035031
	LQ-870, narrow carriage	C060021 I
	LQ-1070. wide carriage	C063001
	LQ-1170. wide carriage	C061021
	LQ-2550, wide carriage	L752
Lasers	EPL-8000	I C09001 I
	ActionLaser 1000	C108001
	ActionLaser 1000 (2MB)	C108001-2
	ActionLaser 1500	C108101
Inkjet	Stylus 800 Ink Jet Printer	C106001
Software		
	Microsoft Windows 3.1	
	Epson MS-DOS 5.0, 5.25″ diskettes	A807162
	Epson MS-DOS 5.0. 3.5" diskettes	A807172
	MS-DOS 6.0, 3.5″ diskettes	A880382
	Epson OS/2. version 2.0	A807062
	DR DOS 6.0, 3.5" diskettes	
	NetWare Lite 1.1, 3.5" diskettes	I

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Epson America (USA)

Epson America, Inc.
20770 Madrona Avenue
Torrance, CA, 90509-2842
Tel: (310) 782-0770
Fax: (310) 782-5051

Epson Direct
P.O. Box 2858
20770 Madrona Avenue
Torrance, CA 90509-1111
Tel: (800) 374-7300

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Fax: (5511) 210-9290

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Caracas, Venezuela
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Epson Canada Limited
Willowdale, Ontario, Canada
Tel: (416) 498-9955
Fax: (416) 498-4574

Epson International Marketing Locations

Epson Deutschland GmbH
Ziilpicher Straße 6,
4000 Dusseldorf 11
Germany
Phone: 211-56030
Telex: 41-8584786

Epson Iberica, S.A.
Avda. de Roma 18-26
08290 Cerdanyola del valles
08036 Barcelona, Spain
Phone: 3-582-15-00
Fax: 3-582-15-55
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Epson Hong Kong Ltd.
25/F., Harbour Centre,
25 Harbour Road
Wanchai, Hong Kong
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Taiwan Branch
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Sec. 3, Taipei, Taiwan R.O.C.
Phone: 886-2-717-7360
Free phone: 886-080-211172
Fax: 886-2-712-9164
Telex: 785-24444

Epson (U.K.) Ltd.
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HP2 7EZ, UK
Phone: 0442 61144
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Epson France S.A.
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France
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